

CREATIVE TOOLS

2014

Contents

Abstract

Introduction

Background

1. Creativity

1-1. People = Creator

/ Homo Faber; Latin for man “the creator”

: “man beings differ from other animals in that humans use tools”

1-2. Definition of “Creativity”

General definition of “Creativity” | Questionnaire | Conclusion
of the definition of “Creativity”

2. Tools: Homo-Faber × Hands × Tools

things that they have been created

Design development

3. Concept development, “creative tools”

3-1. Openess | 3-2. Activity | 3-3. Connectivity

4. Workshop

Workshop Process | Observation

5. The process of modeling and mock-up

5-1. 1st modeling | 5-2. 2nd modeling

5-3. 3rd modeling | 5-4. Final prototype | 5-5. User test

CONCLUSION

- Self evaluation
- Designer’s role

Abstract

Hye Yoon, MIN

Main Subject **Furniture Design**

Title **CREATIVE TOOLS**

Tutor **Pekka Harni**

Professor **Jouko Jarvisalo**

The topic of this master's thesis in furniture design is something I call **CREATIVE TOOLS**. The main concept involves a creative process; primarily, the process endows the individual a role as creator.

This thesis consists of **three parts**:

firstly,

a definition of creativity and of the person as creator;

secondly,

an explanation of design development of the first prototype of these creative tools, a definition of tools; it is started from my imagination how people create a lot of tools by themselves and then it is traced back from history of tools (usually about the form of hooks); Then, for the second part, I showed main concepts for

creative tools from the insights of the definition of creativity and tools, which are connectivity, activity and openness.

Lastly,

based on the main concepts, implementation of the mock-up process where the creative tools prototypes were modified and evolved with the help of Tutor Peka Harni, Professor Jouko Jarvisalo, and Martin Hackenberg in wood workshop.

In my conclusion part,

not only I tried to evaluate my thesis work, but also I talked about designer's role, which have been a challenge while whole process, since I considered people as creators.

Introduction

01

<http://www.epa.gov/oswer/docs/iwg/CellPhones.pdf>. accessed 05/09/2013

Due to large advances in industrial development, we are now living in a highly consumeristic and materialistic world. Most any consumer product is relatively easy to purchase and obtain. Yet, at the same time, such consumer products are just as easily disposed; the following fact attests to this: in Europe alone, approximately 100 million mobile phones are thrown away each year.⁰¹ It might be said that we are living in the era of mass production/disposal. Many companies advertise promises that their new products will improve our lives in a more innovative and creative way. However, I question such promises: are they really improving our lives in a creative way?

02

http://en.wikipedia.org/wiki/Business_process#Adam_Smith05/09/2013.

⁰²Adam Smith discusses manufacturing productivity in his book *Wealth of Nations*; he stated that “a small pin-factory where ten workers, each specializing in a different aspect of the work (18 steps), could produce over 48,000 pins a day, whereas if each of these ten had made the entire pin on his own, they might not have made even one pin a day, and certainly not more than 20.”

And now, our world has attained an incredible efficiency thanks to that revolutionary concept of divided labour. However, the divided-manufacturing-system causes people to focus excessively on their very specific task, while ignoring the rest of the process comprising the whole manufacturing process. As a result people tend to be passive about their work. In other words,

an advanced industrial system led to great improvements in production efficiency, but on the other hand, by minimizing people to specific and monotonous tasks, these people lost knowledge of a holistic manufacturing process.

Whenever I visit people's houses, I try to observe how people use their furniture. It is interesting to see how they organize, configure, and customize use of their furniture based on their interests, situation, or spatial limitations.

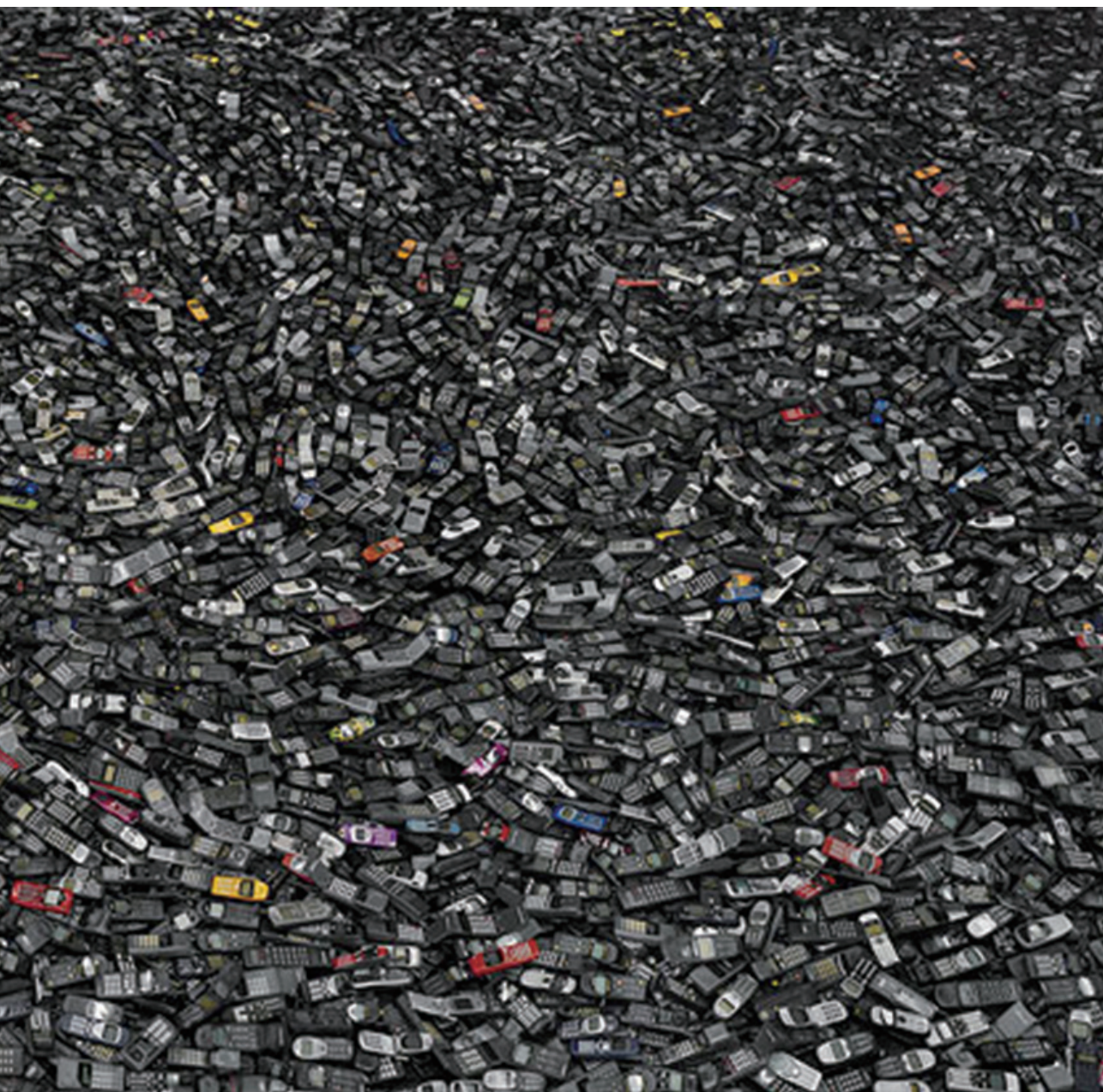
So, I found that people generally have a desire to create their environment themselves and that there might be possibility to regard them as a creator rather than passive users.

Therefore, my dissertation firstly explores the meaning and concept of creativity. Also, Even though, my final results might be not perfectly provided creative environment for people, the whole process of my work can be a journey of answering for creativity.



FIGURE 01 Chris Jordan

<http://www.chrisjordan.com/gallery/intolerable/#cellphones2>



Background study

1.

CREATIVITY

1-1.

PEOPLE = CREATOR

/ Homo Faber; Latin for man “the creator”

: “man beings differ from other animals in that humans use tools”

1-2.

Definition of “Creativity”

- General definition of “Creativity”
- Questionnaire
- Conclusion of the definition of “Creativity”

PEOPLE = CREATOR

/ Homo Faber; Latin for man “the creator”
: “man beings differ from other animals in that humans use

*Whereas Animal laborans is fixated in the question “How?”
Homo faber asks “Why?” – the craftsman, Richard Sennett*⁰³

03

Richard Sennett, *The Craftsman*,
p.7-8, Penguin Books, London,
2009

My thesis proceeds from the concept of man as a creator. Basically, all creative works come from man’s hands physically. Human hands themselves are very sensitive and articulate; feelings from the index finger, middle finger, and thumb are conveyed by way of a complex nerve system. Hands are a major sensory component of the body that performs very delicate and precise movements, driven by about 200,000 neurons.⁰⁴

04

[http://www.innerbody.com/
anatomy/nervous/arm-hand](http://www.innerbody.com/anatomy/nervous/arm-hand),
accessed 04/09/2013

Sensory systems in hands allow us to experience “feeling” and “thinking” at the same time. For instance, when we touch some cold water, we might feel coldness, and then it also might remind us of another experience, perhaps an experience of when we felt the cold water of a lake. And we call this phenomenon synesthesia.

Consequently, hands are one of the most crucial parts of our body for carrying out this kind of sensory function involving “feeling” and “thinking.”

Everyone is able to think, plan, and make with their hands. As “thinking hands” was described in a book, *Craftsman*, because our hands are connected to the brain, the more that hands are used, the more our brains are activated and alive. Therefore, using hands means that we are also thinking.

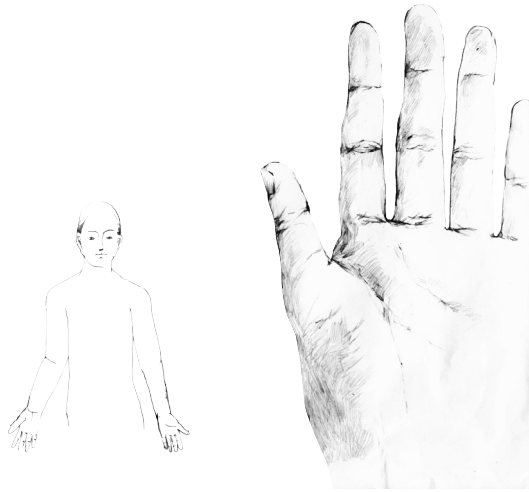


FIGURE 02 Human body and A hand

I remember learning about “Homo faber,” refers to the human-being as a tool-equipped creator. And I assume that the person who coined the “thinking hands” concept might equally value this definition of “Homo faber”: people who have “thinking hands,” people who create by thoughtful use of their hands.⁰⁵

05

http://en.wikipedia.org/wiki/Homo_faber, accessed 03/04/2014

We are different from other animals. In the book *Craftsman*, it is said that “whereas Animal laborans is fixated in the question ‘How?,’ Homo faber asks ‘Why?’” That is why since the beginning of their existence, humans have actively engaged in learning through trial and error as a part of the creative process involved in fabricating useful tools. By learning about what was unsuccessful, they were able to investigate and eventually find creative solutions that were ultimately useful.

For this reason, I suggest that every person, even those who might not be professionals in the design field, already have inherent qualifications as a creator — that is, everyone has an inherent creative ability. However, not everyone recognizes this inherent creative ability within themselves. Many people might have painful memories of failing in their creative attempts.

For example, many of these people may have memories of unsuccessfully attempting to draw simple objects in elementary school, and subsequently, they may have just abandoned altogether any attempts in such creative work since.

However, I would strongly suggest that the technical skill to depict an object with impeccable precision is not a prerequisite for creativity. More important to the creative act is having an idea for changing a thing into something better and having the willingness to create. For example, if you are touched and inspired by the beauty of your friends, family, and even your self, you are already activated and ready to create something. It seems that we are already creators since we are humans with inherent creative desire and ability.

So, the designer's primary role is to be an accommodator who looks for ways to bring out this hidden creative element in people's lives and to thereby stimulate their lives. Therefore, my goal as a designer is to REVIVE PEOPLE'S DESIRES FOR AND ENGAGEMENT OF THEIR INNER "CREATIVITY."

1-2.

Definition of “Creativity”

- General definition of “Creativity”

At this point in time, it is imperative to clarify what creativity means in the context of my “creative tools.”

I choose the adjective “creative” to qualify my tools because I not only want to recognize the creative value of the tools, but also, “creativity” and “tools” are ideas that are related to each other. People have created tools and then, using those tools, they have in turn created other objects.

And now, I need to define “creativity” because doing so will aid us in understanding the “creative tools” that I will explain in later sections.

In a book, *The Nature of Creativity*, the definition of “creativity” is broken down into six categories:⁰⁶

06

Edited by Robert J. Sternberg,
The nature of Creativity, Cambridge
University Press 1988, 99-121p

1 “Gestalt” or “Perception”; Wertheimer (1945) defines creativity as the “process of destroying one gestalt in favor of a better one”, “the intersection of two ideas for the first time.” Duhrsen’s (1957) understands it as the “translation of knowledge and ideas into a new form.”

2 “End product” or “Innovation”; Stein (1953) states that “creativity is that process which results in a novel work that is accepted as tenable or useful or satisfying by a group at some point in time.” Webster’s dictionary (1953) says that “to create” is defined as “to bring into being, to produce as a work of thought or imagination.” Harmon

(1955) mentions that “any process by which something new is produced,” whether it is an idea or an object; this definition also includes new form or arrangement of old elements as part of “creativity”.

- 3 “Aesthetic ” or “Expressive”; Lee (1957) states that “the creative process can be defined as the ability to think in uncharted waters without influence from conventions set up by past practices.” Lange(1957) said that “the creative process is God, the creator, working through his creation, man.”
- 4 “Psychoanalytic” or “Dynamic”; Bellak (1958) assumes that all forms of creativity are permanent operant variables of personality, and he subscribes to the notion that to be creative the ego must regress in order for preconscious or unconscious material to emerge.
- 5 “Solution thinking”; Spearman (1931), defines creativity in terms of correlates; that is, creativity is present or occurs whenever the mind can see the relationship between two items in such a way as to generate a third item. Guilford (1959), on the other hand, defines creativity in terms of a very large number of intellectual factors. The most important of these factors are the discovery factors related to one’s ability to go off in different directions when faced with a problem.
- 6 “Varia”; Rand’s definition is “ that addition to the existing stored knowledge of mankind.” Lowenfeld (1957) speaks of it as the result of our subjective relationship with man and environment. Porsche (1955) sees it as the integration of facts, impressions, or feelings into a new form. Read (1955) feels that it is that quality of the mind which allows an individual to juggle scraps of knowledge until they fall into new and more useful patterns.

1-2.

Definition of "Creativity"

• Questionnaire

The image shows three handwritten questionnaires for 'Creativity' definition. Each questionnaire has a header with 'Name', 'Female/Male', and 'Age'. Below this is a section 'Which colour might be more related to CREATIVITY?' with a row of colored circles. The next section is 'AND WHY?' with a line for the respondent's answer. This is followed by 'Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.' with a list of adjectives and a row of numbers for ranking. The final section is 'Or any other suggestions for words relates CREATIVITY?' with a line for the respondent's answer. Below this is a section 'Could you create words of rhymes for "creativity"?' with a list of words and a line for the respondent's answer.

Questionnaire 1 (Left):
 Name: Asmi Otun
 Female/Male: Female
 Age: 25
 Which colour might be more related to CREATIVITY? Blue
 AND WHY? creative, powerful huge is her
 Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.
 calm peaceful active enthusiastic desirable mysterious unique effortless blank
3 2 1 4 5 6 7 8
 Or any other suggestions for words relates CREATIVITY? imagination
 Could you create words of rhymes for "creativity"?
 C creative
 R refreshing
 E exciting
 A artistic
 I timeless
 I impressive
 V visual
 I irresistible
 T talent
 Y you

Questionnaire 2 (Middle):
 Name: Shirley
 Female/Male: Female
 Age: 20
 Which colour might be more related to CREATIVITY? Blue
 AND WHY? the imagination day and night (not up to day the huge creative idea)
 Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.
 calm peaceful active enthusiastic desirable mysterious unique effortless blank
3 2 1 4 5 6 7 8
 Or any other suggestions for words relates CREATIVITY? imagination
 Could you create words of rhymes for "creativity"?
 C creative
 R refreshing
 E exciting
 A artistic
 I timeless
 I impressive
 V visual
 I irresistible
 T talent
 Y you

Questionnaire 3 (Right):
 Name: Shirley
 Female/Male: Female
 Age: 20
 Which colour might be more related to CREATIVITY? Blue
 AND WHY? it's bright and unique
 Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.
 calm peaceful active enthusiastic desirable mysterious unique effortless blank
3 2 1 4 5 6 7 8
 Or any other suggestions for words relates CREATIVITY? imagination
 Could you create words of rhymes for "creativity"?
 C creative
 R refreshing
 E exciting
 A artistic
 I timeless
 I impressive
 V visual
 I irresistible
 T talent
 Y you

While the definitions of creativity offered by theorists are an important starting point, a more vibrant and vivid expression from the perspective of the layman is needed. Especially in order to find a better starting direction for my creative tools, it was required to ask everyday people their own thoughts on the idea.

For these purposes of getting a fuller meaning of "creativity", I made a simple, playful questionnaire. Rather than directly asking people for their personal definitions of "creativity," the questionnaire was comprised of questions that were somewhat randomly and indirectly related to the concept. In this way, the questions were designed to bring out more honest and demonstrative (i.e., demonstrative rather than simply descriptive) responses. Specifically, the questionnaire consisted of two parts: one part was relevant to colors, and the other was related to personal conceptions of how the respondent understands creativity.

About 16 people responded to this questionnaire, and most of them were aged from 20-30 at the time of the survey.

Name: Gil Bak
 Female/Male: Female
 Age: 21

Which colour might be more related to CREATIVITY?

AND WHY? It gives energetic and inspiring impressions, orange is my absolute favorite.

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

FUN / REFLECTIVE / INSPIRED

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

Name: Sheryl
 Female/Male: Female
 Age: 33

Which colour might be more related to CREATIVITY?

AND WHY? It is the brightest

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

Name: Ally
 Female/Male: Female
 Age: 26

Which colour might be more related to CREATIVITY?

AND WHY? It can get things going

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

Name: Yuhan Zhou
 Female/Male: Male
 Age: 25

Which colour might be more related to CREATIVITY?

AND WHY? In looks, always

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

In creative

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

Name: June Guo
 Female/Male: Female
 Age: 24

Which colour might be more related to CREATIVITY?

AND WHY? Orange, for we orange clay, bones painting and design

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

reverse, extraordinary

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

Name: Heidi Park
 Female/Male: Female
 Age: 24

Which colour might be more related to CREATIVITY?

AND WHY? purple, feel like this color so become nature

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

looking away

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

Name: SV
 Female/Male: Female
 Age: 21

Which colour might be more related to CREATIVITY?

AND WHY? make me think of sunlight for almost everything

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

Name: WANYING CHU
 Female/Male: Female
 Age: 20

Which colour might be more related to CREATIVITY?

AND WHY? We are colorful, inspired colour? It can be anything

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

Name: MIKAYLA SMITH
 Female/Male: Female
 Age: 17

Which colour might be more related to CREATIVITY?

AND WHY? See it like a clean page the foundation for a house

Which word of adjectives are more inspired, when it comes to CREATIVITY and try to rank it.

calm peaceful active enthusiastic desirable mysterious unique effortless blank

4 3 2 1 0 1 2 3 4

Or any other suggestions for words relates CREATIVITY?

Could you create words of rhymes for "creativity"?

C	creative	C	creative
R	refreshing	R	refreshing
E	exciting	E	exciting
A	artistic	A	artistic
T	timeliness	T	timeliness
I	imaginative	I	imaginative
V	visual	V	visual
I	imaginable	I	imaginable
T	talent	T	talent
Y	you	Y	you

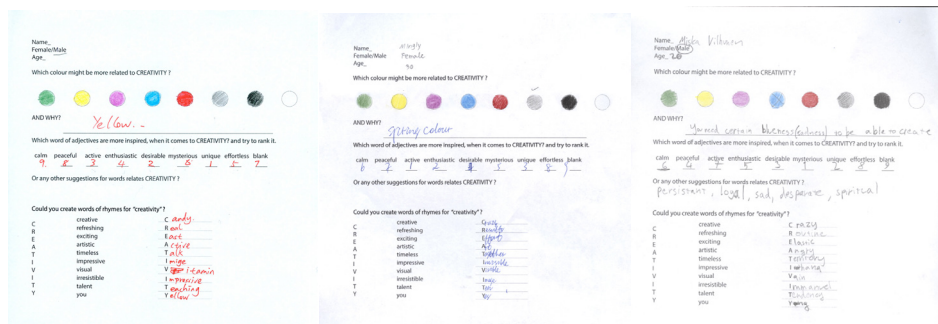
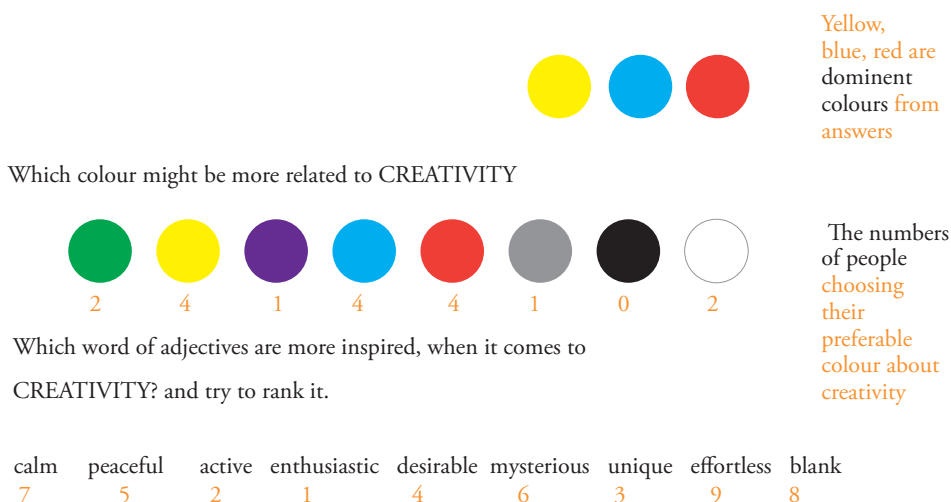


FIGURE 03 Papers of Questionnaire

After I finished this survey, I tried to analyze and synthesize



Or any other suggestions for words relates CREATIVITY ?

Additional descriptors of creativity cited by respondents were “reflective”, “inspired”, “fun”, “spiritual”, “reverse extra normal”, “innovative”, and “imaginative”

The results of ranking for the words of adjectives about creativity

C	creative	candy	Compelling	Cinema	Crave for	Collaboration	Cakes	Cry
R	refreshing	<u>Real</u>	<u>Real</u>	<u>Real</u>	<u>Real</u>	Role	Roll cakes	Reborn
E	exciting	East	Elevating	Eastern	Eroticism	Emerge	Egg rolls	Experimental
A	artistic	<u>Active</u>	<u>Alive</u>	Aesthetic	And	Abnormal	Appocato	<u>Alive</u>
T	timeless	Talk	Thoughtful	Terrific	<u>Try</u>	Test	Tangerine	<u>Try</u>
I	impressive	<u>Image</u>	Ingenious	<u>Intelligent</u>	Irresistable	<u>Imaginative</u>	Ice cream	Impulsive
V	visual	<u>Vitamin</u>	<u>Vital</u>	<u>Vegetable</u>	<u>Voyage</u>	<u>Voyage</u>	Vanila creme	<u>Vivid</u>
I	irresistible	<u>Impressive</u>	Important	Illustrator	Indulgence	Identity	Ice latte	Innovative
T	talent	<u>Teaching</u>	Truth	<u>tell</u>	seT	Tactic	Time	<u>Toy</u>
Y	you	<u>Yellow</u>	Yield	<u>Yellow</u>	You free	Yale	Yogurt	<u>Yelling</u>
		<u>Colorful</u>	<u>Colorful</u>	<u>Crazy</u>	Courage	Circle	<u>Crazy</u>	<u>Crazy</u>
		<u>Renew</u>	Rich	Routine	Recharge	Review	Results	<u>Realize</u>
		Empty	Enriching	Elastic	Egg	Enjoy	Effort	Evangelical
		Aroma	Ambitious	Angry	<u>Alive</u>	Air	Art	Arouse
		Time	<u>Thinker</u>	Territory	<u>Torn</u>	Travel	<u>Teacher</u>	Tolerance
		<u>Imagination</u>	<u>Intelligent</u>	lhana	<u>Imagine</u>	Idea	<u>Imageable</u>	<u>Imagine</u>
		Various	Volatile	Vain	<u>Vivid</u>	<u>Vision</u>	Visible	<u>Vitalize</u>
		<u>Identity</u>	Ingenious	Immanuel	<u>Image</u>	<u>Identity</u>	<u>Image</u>	<u>Illusion</u>
		Teamwork	Touching	tendency	<u>Tell</u>	Theme	<u>Tell</u>	<u>Toy</u>
		Yourself	<u>Yelling</u>	<u>Young</u>	<u>Yellow</u>	<u>Young</u>	Yes	<u>Yelling</u>

Underlined words means that they mentioned over two times.

Interestingly, for aphabet 'E', people created all the different words.

Conducting this survey was an interesting process. The point of the questionnaire itself was actively to encourage for people to react on their own conceptions of creativity and come up with interesting responses. To my delight, people's responses were quite creative and at times even whimsical. They thought of amusing and creative answers, rather than staid, weary ones.

1-2.

Definition of “Creativity”

- Conclusion of the definition of “Creativity”

07

Edward de Bono, *How to have creative idea*, Random House, 2012, 9-4p

“An ordinary man is walking down the road. A group of people seize him and tie him up with a rope. Then a violin is produced. Obviously, the man tied up with the rope cannot play the violin. So what do we say? We claim that if the rope was cut the man would play the violin. This is clearly nonsense. Cutting the rope does not make the man a violinist.” _ Edward de Bono⁰⁷

I have indeed learnt a great deal about creativity from talking with people on the subject, and ultimately, it led me to a fuller personal conception of creativity. The questionnaire itself was effectively a tool to get people to think more creatively beyond what is typically required in their daily routine. As a result of reviewing questionnaire responses, I came to conclude that conceptions of creativity are largely based on personal experience and context.

While conducting these interviews, I began reecting upon some writings by Edwards de Bono, who wrote several books about creativity. De Bono says that creativity does not come from somewhere mysterious; it is from our experience and from things that we have learned. He explains how creativity can be a skill that can learned through early and continued development. Additionally, there is a marked contrast between the ideas of creativity and art creativity. The latter creativity might be more inherited talent, which is demonstrated through exceptional

inborn ability; an example of a gure with this art creativity is the prodigy Beethoven, who was famous for his work as a composer and pianist. The former meaning of creativity could encompass a more general denition that refers to everyone’s ability to use their knowledge and information to create.

I recall in my childhood playing with LEGO blocks by following instructions included in LEGO box. That particular LEGO set was called “PIRATES of the CARIBBEAN.” Soon after finishing that set, I started to make dierent kinds of boats and buildings easily on my own, without instructions.

I especially remember that my friends and I tried to make interesting stories to go along with our LEGO buildings, boats, houses, and streets. It was always fun to create my own stories. In this way, my experience with LEGOs was not only focused on the LEGO construction itself but also on the creative process of formulating new narratives to give the creations life. Accordingly, the creation and incorporation of personal narratives seemed to bring about new and continuous life to the activity.

So, pulling from this childhood memory, I decided to incorporate the same personally imaginative structure into my “creative tools.” Specically, I wanted to provide a proper environment wherein people could both create their own narratives and be equipped with the means to create the objects of their imaginations in reality. My “creative tools” provide this very context and equip people with the means to be this kind of creator.

Background study

2.

Tools:

Homo-Faber × Hands × Tools

things that they have been created

TOOLS are generally means that

- 1 a piece of equipment, usually one that you hold in your hand, that is designed to do a particular type of work*
- 2 something that you use in order to perform a job or to achieve an goal⁰⁸*

08

<http://www.macmillandictionary.com>, accessed 12/01/2014

We are already surrounded by a lot of tools. In the morning, we are awakened from bed and go to the kitchen and pull out chairs to eat breakfast on a table. Then we use a fork , spoon, knife, and plate to actually eat our breakfast. We might then start our day by writing a plan with a pencil on a notepad. Everything seems already to be provided by others who have designed and manufactured these tools.

While we may take these tools for granted, if we think back, we may be able to imagine a time when these tools were unavailable; there was a first moment when someone recognized the need for spoons, forks, chairs, or tables and then had to imagine and create such items.

At first, human-beings faced some problems, which they then resolved through imaginative thinking and thoughtful planning; they often used their hands to ultimately create useful tools. Notably, they used their hands to first create these tools and then afterward to control their use of these tools.

THINK—HANDS—CREATE—TOOLS—HANDS—CREATE—THINK—

I tried to visualize this process in a few steps.

In the beginning stages, people could very well have found their ideas for tools from things in their natural contexts. I imagine that they may have seen some quality in a part of nature that captured their imagination, which they then in turn applied to their conceptualization and creation of a new tool.



FIGURE 04 GROUND AND STRAIGHT LINE

People might have first seen A STRAIGHT LINE from viewing THE HORIZON. Then perhaps they had learned that it has A FUNCTION TO STAND WEIGHT.

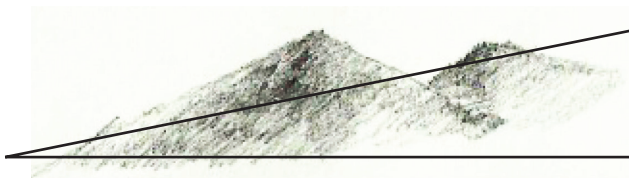


FIGURE 05 MOUNTAIN AND DIAGONAL LINE

After first seeing DIAGONAL LINES from the outlines of mountains, hills, and trees, they might have developed an understanding that diagonal lines or planes could serve

physically different functions than straight lines or planes could.

For instance, they may have realized that a diagonally angled surface could SHELTER them by blocking out the wind, that a thing moving down it would accelerate, or even more simply that it provides a nice place to lean something against.

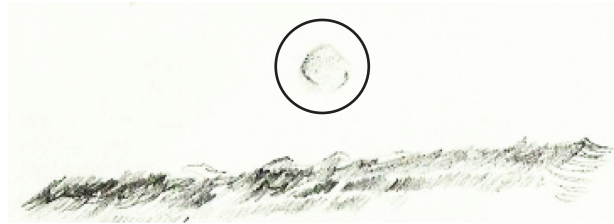


FIGURE 06 SUN AND CIRCLE

Also, when they looked at the sky, they could have seen the PERFECT CIRCLE of THE SUN and MOON relating them to similarly round, small pebbles. Then through experimentation perhaps they could have acquired knowledge about HOW CIRCLE SHAPES facilitate ROLLING actions in objects.



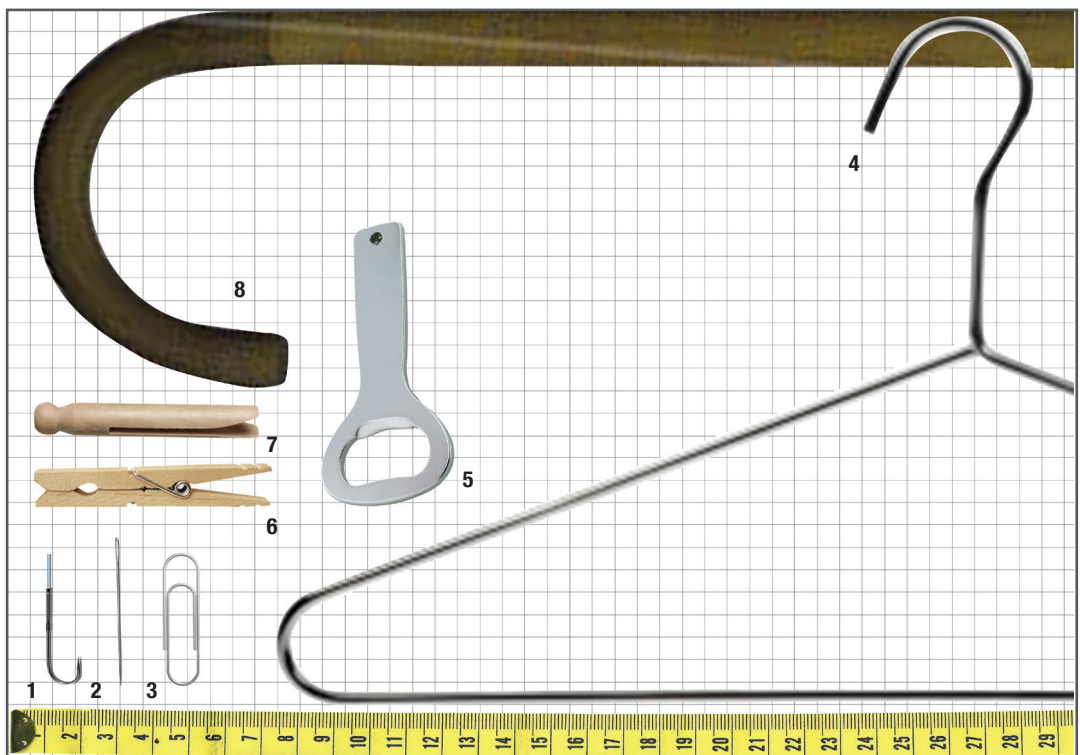
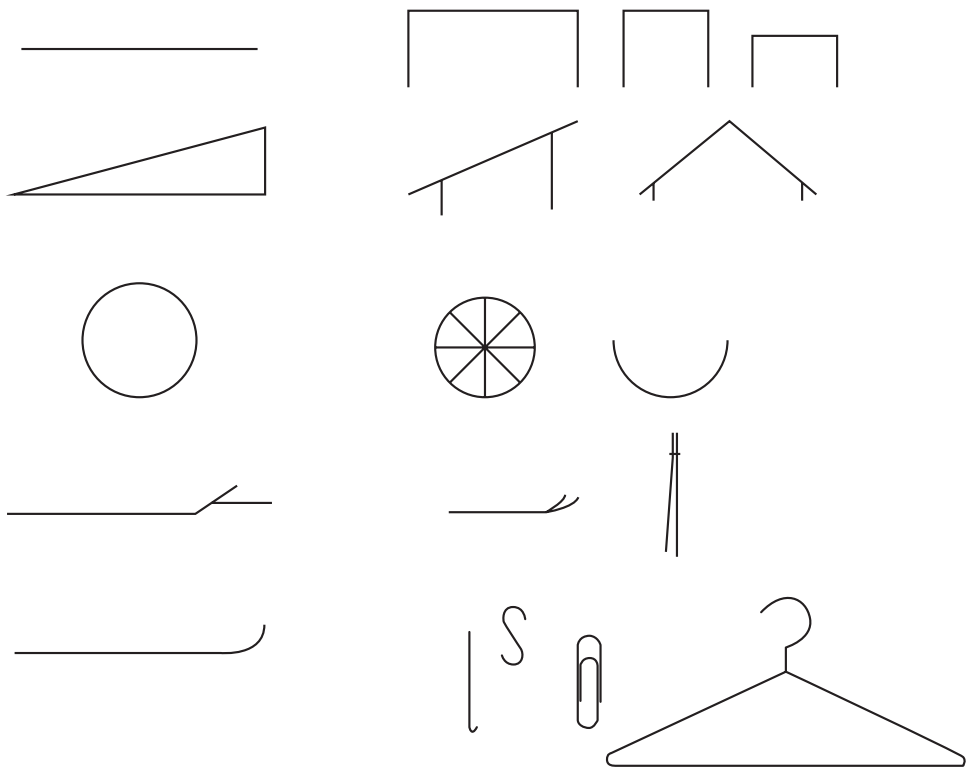
We could also imagine that ancient people used items in their immediate NATURAL CONTEXTS and experimented with how they could use sharp BRANCHES to poke objects, perhaps even some meat.



And during the iron age, the form of 'CURVES' HAD COME INTO WIDE USE IN WEAPONS AND FARMING TOOLS. It is quite possible that the idea for these long tools originally came from the SHAPE OF THE BRANCH



AND THEN, PEOPLE STARTED TO USE THE FORM OF 'CURVES' IN THEIR FISHING TOOLS: HOOKS.





11,000

B.C

A.D



1500



FIGURE 07

1 The world's oldest shing hook, made of Trochus shell, dates back to -11,000 years BP. (Credit: S. O'Connor) This hook had been used for shing, and was discovered by Professor Sue O'Connor of the Australian National University in Canberra and a team of scientists. They have uncovered over 38,000 sh bones from 2,843 fish dating back 42,000 years.



FIGURE 09

2 Tambour needle made of bone, Great Britain, 1800-1830. "Crochet is a type of needlework with an open, lacy appearance, which is formed with a hook and single length of thread making a series of loops, chains, and knots. Tambouring is a type of embroidery in which chain stitches are worked with a hook through the surface of a fabric usually stretched taut in a frame ('tambour' is French for 'drum'). This hook has a sharp enough pointed end to have been used for tambour work, but would also have been suitable for fine crochet. "



FIGURE 08

8 It is not known exactly when or where the walking stick/cane was created. It could have been a natural development of experimenting with the different uses of branches; eventually it would follow that one appropriate function could be to assist in standing or walking. This cane shape has been found represented in relics of ancient Egypt where they were buried with pharaohs out of the belief that it would help them walk in the afterlife. In addition to being used as a weapon and tool, the cane was also used as an ornament or status symbol. Around 16th-century Europe, the walking stick became a status symbol considered part of the dress of the royal class; it also served as a popular fashion accessory.

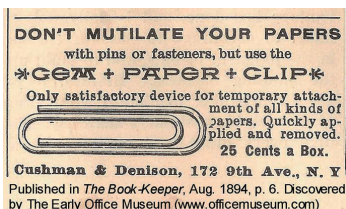


FIGURE 10

3 After the steel wire industry came into being around the 19th century, now this paper clip have been able to create in a form today. Generally paper clip today is a Gem clip which was invented by Munich manufacturing firm, and Howard Surin. Because there were some subsequent variations of the paper clip, it is a bit controversial who was the first paper clip. Even though Johan Vaaler patented several of his paper clips in June of 1901 in the USA, He traditionally consider as a first inventor for a paper clip in 1899.



1800



1899



1894



1900



1903

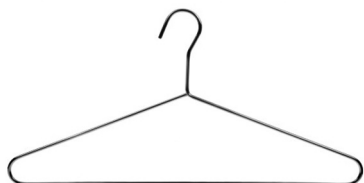


FIGURE 11

4 The origin of the wire coat hanger wire coat hanger by Albert J. Parkhouse, 1903

“The invention of the wire coat hanger is attributed to Albert J. Parkhouse in 1903. between 1900 and 1906, over 189 different patents were granted on different versions of ‘garment-hangers’ worldwide. Steel wire has been used to shape the hanging garments, sometimes combined with wood, fabric, or sheet metal, for better or for worse, the functions changing with the requirements of every era’s clothing styles. Let’s here examine some of the beautiful shapes and forms.”

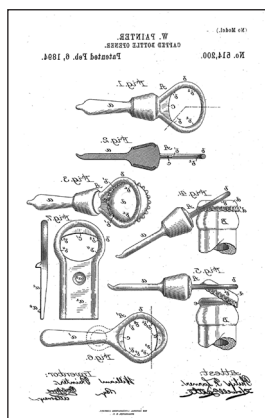


FIGURE 12

5 It is not known exactly who first invented the bottle opener, but it had been seen in Europe since around 1700. Because there were capped bottles since around the 1880’s, there had been need for bottle openers or stoppers; William Painter got a patent for a bottle opener in 1894 in the US.



FIGURE 13

6-7 The clothes pin: two clamping ends kept constantly under pressure by steel springs or pressed against each other by virtue of the particular shape of the peg itself. It is used to be crafted from Shakers Artist, “Unidentified; Pleasant Hill, Kentucky c. 1900; Wood with metal band” American Folk Art Museum, gift of Herbert Waide Hemphill Jr., 1985.24.3. The first design most similar to the modern clothespin was invented by David M. Smith in 1853. His design was developed by Solon E. Moore.



FIGURE 13

The history of tool (especially about the form of hook) have been formed naturally by people. Perhaps the forms formed by people might be anonymous in the beginning(even though it was patented later) not attractive, but they have been employed in a proper and real situation.

Especially, My work, which I did in 2011, could be an example that explains an existing-form could affects to another design work.

I focused on the form of "hooks" for my hangers. The form of hooks has been used for a long time in many tools; the meaning and use of this shape has evolved naturally over time, as it has often been employed in tools that meet people's needs for grabbing, hooking, or hanging. Therefore, when we see a hook, we are now all familiar with its uses, so even though nobody explains, the hook automatically registers as a sort of language which invites you to use it to "grab" and "hang". My hanger incorporates this "grabbing" and "hanging" language that is evoked by the hook form.

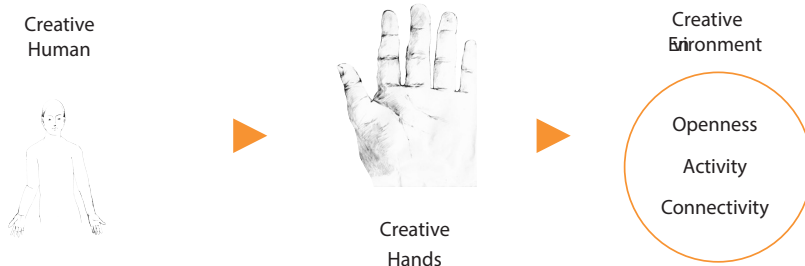
While I was designing this clothes hanger, I thought that my hanger could be part of a further evolution of the form of hooks. In the process, I was reminded of a quote: "there is nothing new in this world, but only re-creation." Often, we think that we are creating something altogether new and original, but in fact, we are inspired from somewhere before.

Design Development

3.

Concept
development,
“*creative tools*”

1 Openess | 2 Activity | 3 Connectivity



CREATIVE TOOLS

“tools,” from a dictionary definition:

- 1 a piece of equipment, usually one that you hold in your hand, that is designed to do a particular type of work.
- 2 something that you use in order to perform a job or to achieve a goal.

As has been mentioned in the previous chapter, physical tools always have played the role of helping us do something. Specically, I had researched the history of the form of hooks and found that people created various types of hooks for purposes of hunting, shing, hanging, farming, and walking/standing. To put it more concretely, tools can be seen as a means that allows people the possibility to take part in the adventure of further creation. Tools are evidence of people’s innate sense and desire for creativity throughout history.

Additionally, in terms of defining

creativity, even though my research showed that there are many different ways to define

“creativity,” it should be reiterated that the meaning of creativity for the purposes of this thesis will focus more on providing creative environment.

And for a creativie environment, to help people to creative something more, I chosen the concepts of “activity”, “connectivity” and “openness” based on the questionnaire reaserch.

Therefore, the definition of “creative tools” for my thesis work is the following: a piece of equipment, usually one that you hold in your hand, that is designed to allow you to create your own tool (e.g., a piece of furniture); these creative tools can be characterized by the following components: “openness,” “activity”, and “connectivity.”

Concept development of creative tools

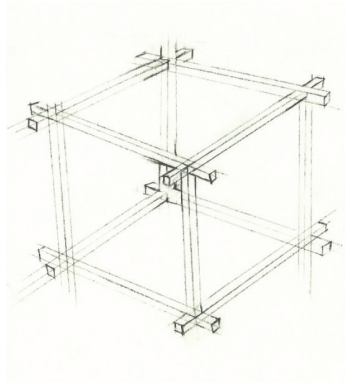


FIGURE 14

Creative tools :

a piece of equipment, usually one that you hold in your hand, that is designed to allow you to create your own tool (e.g., a piece of furniture); these creative tools can be characterized by the following components: “openness,” “activity”, and “connectivity”



3-1. OPENESS

1) Space

Space could be a communication between Human-beings and this world. Conceptually, we can discover the spaces from tables, chairs, and houses, also even in public square if there is possibilities to be placed. In this process, the meaning of “space” would be regarded to be more wide, open, and imaginative, for that reason, the concept of space is abstract, physical and philosophical. holding In this understanding, there might be more open position for people to build it going beyond furniture.

Admittedly, to place emphasis on creativiy of “Openness”, the concept of space has broaden to the limitation for my creative tool.

2) Creative man, Creative space

Human beings are inherently spatial beings who define space by the function, activity, and/or experience assigned to it; for example, we often understand office, church, and school spaces by the way we use them and experience them. It follows that we are spatial beings who create meaning for our spaces.

17

Otto Friedrich Bollnow, translated by Christine Shuttleworth, Edited by Joseph Kohlmaier, *Human space*, Hyphen Press, London, 2011, 254-255p.

¹⁷“Experienced space” is an idea mentioned in the book “Human Space” by O. F. Bollnow. Bollnow holds that space is defined by people’s activity and experience rather than simply by the objects that fill the space. Thus, mathematical space results from experienced space, he says.

The concept of “experienced space” is very similar to the way Koreans have traditionally perceived space; Koreans have traditionally valued “the emptiness” rather than “fullness” in a space; this is based on the thought that “emptiness” (of space) generates more activity and invites people to experience it and use it as they wish. Therefore, this understanding of open space suggests to its users a sort of freedom.

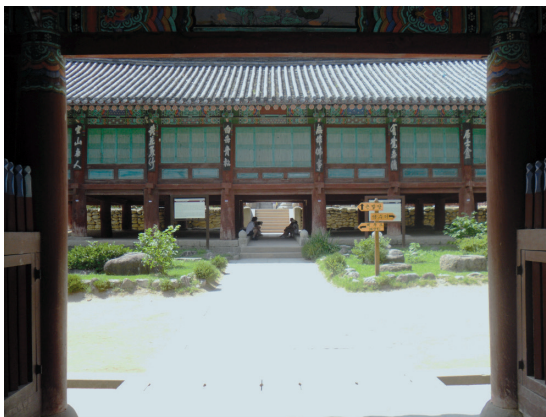


FIGURE 15



FIGURE 16

3-2. Activity

Structuring a space

While the “openness” component of my creative tools identifies the importance of possibility and imagination, the “activity” component is the part of the process when people must actually do the work of assembling their envisioned item. Again, people create meaning in a space by configuring it in some way. Building a structure itself might be interpreted as an act of configuring space. By the structuring of our components, we enclose space and ultimately end up with a thing that has specific functions. Furniture is a primary example of this: chairs, tables, and bookshelves are the useful products of a configuration of space and substance. Over time, people have found new functions and ways of configuring such space; usually, the emergence of new technologies has coincided with these developments.

3-3. Connectivity

1) Applying traditional joint for open structuring

The “connectivity” component of my creative tools emphasizes the connecting of smaller parts to finally attain a larger result. Human beings create meaning for space through experience, use, and configuration; when these creative tools are appropriately assembled and configured, the result is a useful product. For my creative tools, I provide a joinery system that allows people to make structures by connecting smaller pieces. Because the pieces are assembled according to the planned use and imagination of its user, there might be hundreds of possible, different results.

In the past, the basic joinery system was applied in various forms in indoor windows and outdoor gates; people even built houses using mainly the joinery system. The joinery structures served in both decorative and functional (i.e., weight-bearing) capacities.

For example, designer Jong-su Kim designed a partition by applying a Korean traditional joint called “JJAIM.” He obtained inspiration for the idea from lattice windows used in traditional Korean houses; he recreated the latticework in the form of a divider.

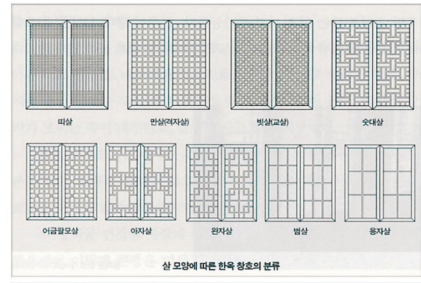


FIGURE 17



FIGURE 18



FIGURE 19

2) Joint for structuring

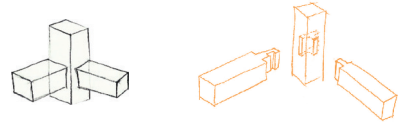
I studied designs and methods in traditional Korean joinery. The assembly of these traditional designs does not require screws, nails, or bolts. Notably, a variety of joinery techniques were used in the furniture of the Joseon Dynasty.

These joinery techniques are very basic ways of structuring components of things like furniture and even houses; these techniques are still in use today.

— Tongue and groove joints allow two flat pieces to be joined strongly together to make a single flat surface.

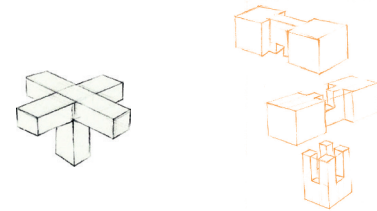
01 Interlocking Joint for Seat Rails of Chair to Leg.

This joint is an interlocking system that prevents motion of the side rails; it is widely used for chairs. The groove in the side rail tenon is locked into another groove of the tennon across it.



02 Puzzle joint, or Dovetail joint.

The dovetail joint is a technique commonly seen in many Eastern and Western traditions. In the traditions of Asian countries such as Korea, China, and Japan, these compound joint structures were often designed to fit together like pieces of a puzzle.



03 The mortise and tennon joint.

The mortise and tennon joint has been used for many years around the world to connect pieces of wood, not only in Asian cultures but also in Western cultures. It is a basic but strong design.



FIGURE 20-1~6

Creative tools

a piece of equipment, usually one that you hold in your hand, that is designed to allow you to create your own tool (e.g., a piece of furniture); these creative tools can be characterized by the following components: “openness,” “activity”, and “connectivity”

Objectives of CREATIVE TOOL

As we get the definition of creativity before, The purpose of “creative tools”, enthusiastically, and actively would direct for people to be activated and inspired their creativity by using my tools.

- 1 Let people use their hands as much as possible as an “activity”
- 2 Provide an open possibility for creating where people can easily construct by themselves.
- 3 Applying the properties of wood to the joinery system.

CREATIVITY

Based on my research of creativity, creativity might be from creative environment. and creative environment would be provided by “openness”, “activity”, and “connectivity”.

CONCEPT

• MAIN CONCEPT

OPENESS



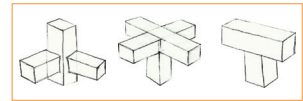
Space, emptiness

ACTIVITY



Open structuring Structuring space

CONNECTIVITY



Developing new joinary system

FUNCTION

Basically, throughout structuring, people could make structures for basic furniture such as tables, chairs, and bookshelves, since every dimension for pieces is based on the scale of human body, so that it could be accommodated for people's need for furniture.

Design Development

4.

Workshop with 1st prototype

Workshop Process | Observation

From the my own denition of “creativity” before, The purpose of “creative tools”, enthusiastically, and actively would direct for people to be activated and inspired their creativity by using my tools.

As I set the goal of creative tools, I realized that I need to design some blocks which would have possibility of connectivity based on my reaserch about them. Lego blocks are a good example that have their own certain joining system by their own joint. Therefore, I decided to design a

joinit part rst, then I would developpe whole system for that.

And I am interested in traditional joinary system, where has not used any screws and nails for connectivity, the wooden tension might be interesting part to get the idea of joining system for my creative tools.

Images below are the process of designing, how I tried to apply the wooden tention principle to joining system.

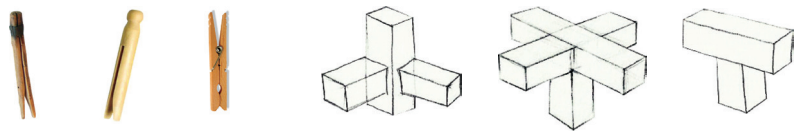


FIGURE 21



FIGURE 22

1st Modeling

1st prototype is roughly designed with the limitation of certain length and certain angle.

CONNECTIVITY

ACTIVITY

OPENESS

Usability

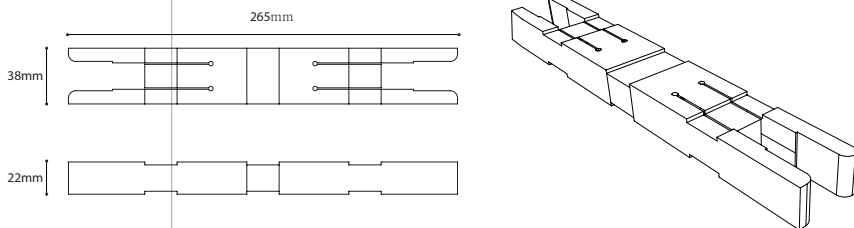
Functionally, the components need to be able to connect with each other in order to achieve the kind of connectivity in structure that you might, for example, achieve with connecting Lego blocks. The natural principle of wood-spring-fold will be applied. So the components will need to be designed to easily snap together by hand.

Beauty

As simple and honest a form as possible; for ease of usability, a simplistic and minimalistic aesthetic is required.

Playfulness

The activity of structuring and connecting the components might be sustained for play.



Instruction



Workshop

A workshop was organized during the summer time, in Nam-sung Elementary School in Cheong-ju, Korea. The 25 participants were second-year students, roughly 9 years old, and were split into 5 groups.

1 Purpose

My creative tools were intended to allow people to construct structures on their own. Firstly, I wanted to test my tools to see how children would implement it and how it would stimulate their imagination and creativity.

Secondly, I wanted to fine-tune and develop the design based on how I observed people reacting to and using my creative tool.

2 Process

Introduction on shaping and structuring – conceptual drawing by puzzling (i.e., use of cut-out creative-tool-shaped puzzle pieces) – structuring and assembly with friends – presentation of product.

There was a short introduction on forms, shapes, and structures.

And I distributed 2D tools (i.e., puzzle pieces in the shape of the creative tool component) to let children produce conceptual drawings before attempting to structure and assemble the actual creative tool components.

(Note: I did not place any limitations or requirements on what they could draw for their conceptual drawings.)

3 Key points about Workshop

3-1 PLAY *“play” is the highest form of research_ Albert Einstein*

Since subjects participating in the workshop were 9-year-old children, there needed to be more motivation for involving them in this activity: fun.

Playing is an open, active, and energetic means of engagement. Roughly, randomly, and freely, children might come up with new ideas while playing.

Thus, emphasis on fun and playing was a key role in facilitating this workshop; regardless of how useful their 1st prototypes would end up being, the children were encouraged to use their hands to create in a playful way, and to have fun.

3-2 TALK open dialogue

As much as I can, I gave an effort to provide open dialogue, even though it is about constructing, because I was interested in what kind of conversation would be occurred and how it could be more developed in a dialogue between people.

3-3 Observation

I took several pictures, and recorded video for 3 hours. Mostly I observed how children were playing with my tools, not actively participated in.

Drawing

“The creation of new is not accomplished by the intellect but by the play instinct”

_Carl Jung

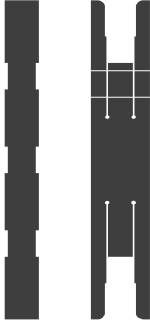


Figure 23

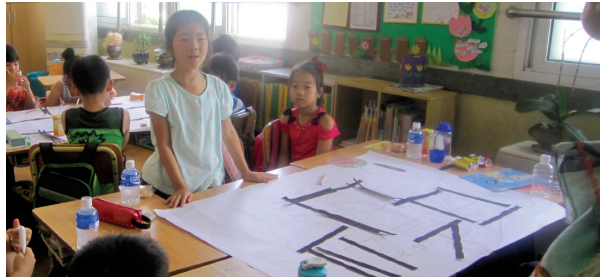


Figure 24

Before assembling the actual creative tools, the children were provided with 2-D cutout pieces that represented the creative tools (“puzzle pieces”) and a gridded sheet of paper so that they could conceptualize and plan out what they would make with the actual tools.

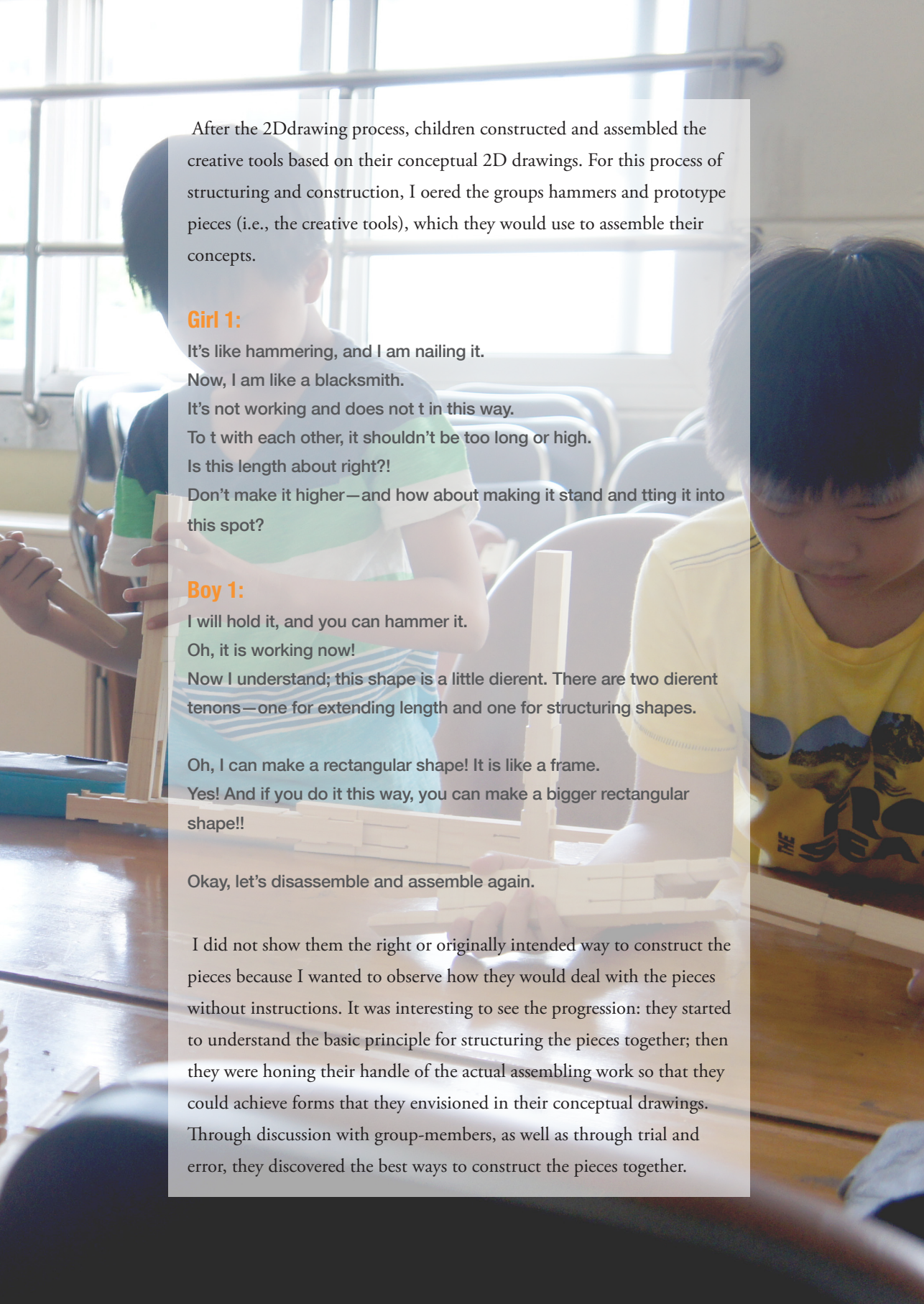
This was a process for brainstorming, to encourage the production of ideas by way of playing. They hand-drew their ideas on the gridded sheets of paper, and they were encouraged to discuss with group members how they should configure and assemble the pieces given to them.

Children started drawing various figures such as schools, friends, hospitals, clocks, rooms, and, so on. After that, they tried to modify their drawings into more simple geometric figures so that the drawings could then be more easily represented by the puzzle pieces, which they would ultimately use to construct their concept. In this process, play provided an environment not only for learning about drawing and working freely with puzzle pieces but also for people to relate to themselves and others as they dialogued and subsequently built a product with their group-members.

Structuring



Figure 25

A photograph of two children sitting at a wooden table, constructing structures using light-colored wooden blocks. The child on the left is a girl with dark hair, wearing a green and white striped shirt. The child on the right is a boy with dark hair, wearing a yellow t-shirt with a graphic. They are in a room with large windows in the background, letting in bright light. The text is overlaid on a semi-transparent white box.

After the 2D drawing process, children constructed and assembled the creative tools based on their conceptual 2D drawings. For this process of structuring and construction, I offered the groups hammers and prototype pieces (i.e., the creative tools), which they would use to assemble their concepts.

Girl 1:

It's like hammering, and I am nailing it.

Now, I am like a blacksmith.

It's not working and does not fit in this way.

To fit with each other, it shouldn't be too long or high.

Is this length about right?!

Don't make it higher—and how about making it stand and fitting it into this spot?

Boy 1:

I will hold it, and you can hammer it.

Oh, it is working now!

Now I understand; this shape is a little different. There are two different tenons—one for extending length and one for structuring shapes.

Oh, I can make a rectangular shape! It is like a frame.

Yes! And if you do it this way, you can make a bigger rectangular shape!!

Okay, let's disassemble and assemble again.

I did not show them the right or originally intended way to construct the pieces because I wanted to observe how they would deal with the pieces without instructions. It was interesting to see the progression: they started to understand the basic principle for structuring the pieces together; then they were honing their handle of the actual assembling work so that they could achieve forms that they envisioned in their conceptual drawings. Through discussion with group-members, as well as through trial and error, they discovered the best ways to construct the pieces together.

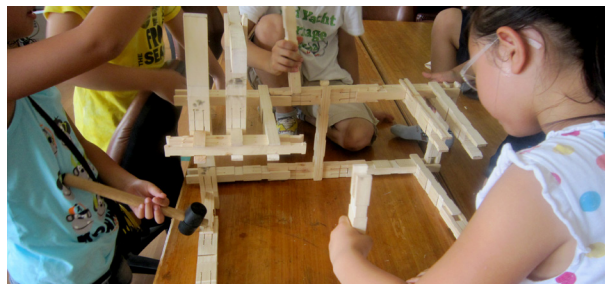


Figure 26 Building a boat

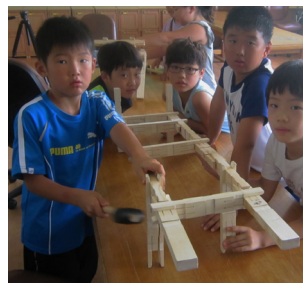


Figure 27 Ladder



Figure 28 Gun



Figure 29 Chair



Figure 30 Robot

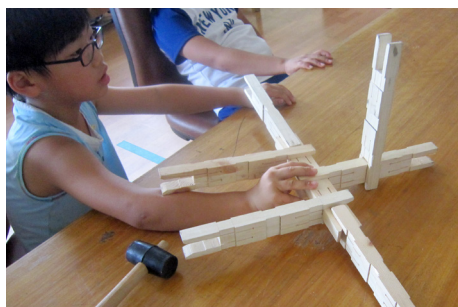


Figure 31 Bird

The children made various shapes from the first prototype version of the creative tools. They imagined some real figures from the simpler component forms that were primarily rectangular and 90 degree shapes. They tried to make ships, airplane, and guns.

There was the process of classifying, constructing, naming. And the teacher of the class commented that the creative tools could be perhaps be used in another capacity: to help children improve mathematical skills. The reason for this is that when the children were planning and building with the tools, they seemed to consider physical dimensions like length, area, volume, scale, portions, and ratios. In this way, the creative tools also have the possible utility as an educational mathematics tool.

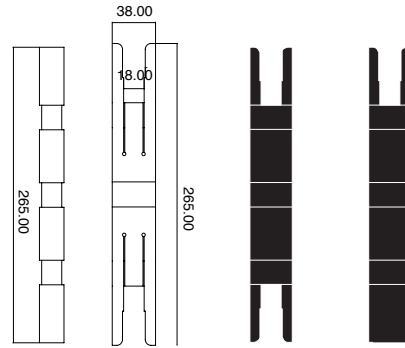
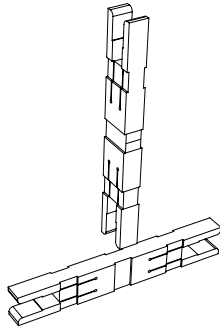
Design Development

5.

The process of
modeling and
mock-up

1 1st modeling | 2 2nd modeling | 3 3rd modeling |
4 Final prototype | 5 User test

5-1. 1st modeling



Joinery System



ACTIVITY > OPENNESS > PLAYFULNESS > CONNECTIVITY > USABILITY > BEAUTY

The 1st modeling of the creative tools was based on the idea of a block system, which would make it easier to construct and connect with other pieces; such a connective form would also allow for flexibility and variety of possible structural outcomes. The creative tools could be used for creating furniture, but it could also be used to create toys or other playful objects. Also, because the creative tools have this inherent element of “play” and “fun,” they engage and unlock people’s creative powers in a

way that boring and more uninteresting activities cannot.

However, even though the 1st modeling of the creative tool had merits of playfulness, it had a structural weakness and a rough appearance.

When I discussed this design with my tutor, Pekka, we agreed with these, especially its appearance seems a bit too technical, and robust rather than simple, minimalistic and natural.

And, if its rough appearance became more refined well, it would be expected to afford people to use it more easily and friendly.

Secondly, there is a need for analyze to define more clearly about this tool based on a certain criteria, because if it is too much open, there would be confusion for sustaining to keep using this.

5-2. 2nd modeling

In the 2nd prototype, I tried to put more limitations on the scope of the creative tool's functionality.

The intention for this direction was firstly, to reach a greater balance between usability (i.e., functionality, specifically insofar as the creative tool could be used to construct useful furniture items) and flexibility (i.e., the freedom that the user has to create whatever they wish). By concentrating more focus on usability, the criteria for its use shifted more heavily towards its usefulness as a tool for building furniture rather than solely as a tool, or toy, for play and recreation.

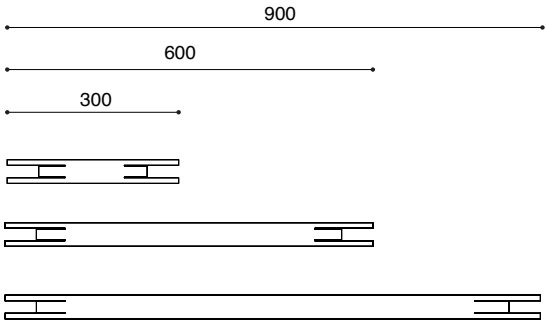
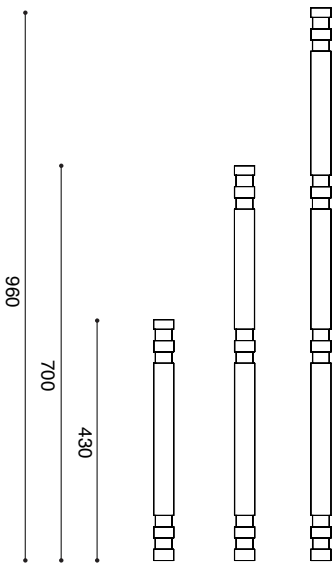
Secondly, the appearance of the design was simplified in order to achieve a more minimalistic aesthetic. As a result, it would be positioned as a more attractive, friendly-looking item for people to use easily in their living space.

There might be also another challenge to think about Not only the point of structuring, but also the possibility of different composition out of pieces.

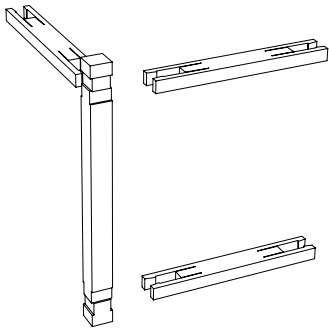
I would also suggest that people can construct the various sizes of structures by different compositions.

To tell the truth, I have not developed the composition part for structures, since

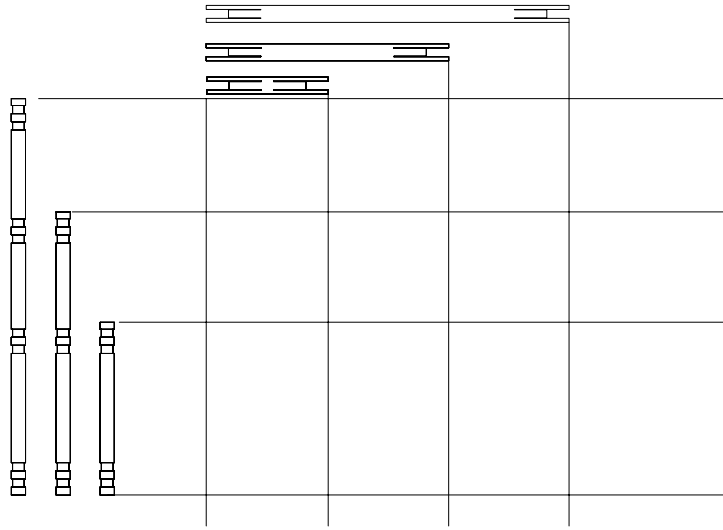
finding a perfect composition is not my ultimate goal.



Detail development of joinery part.

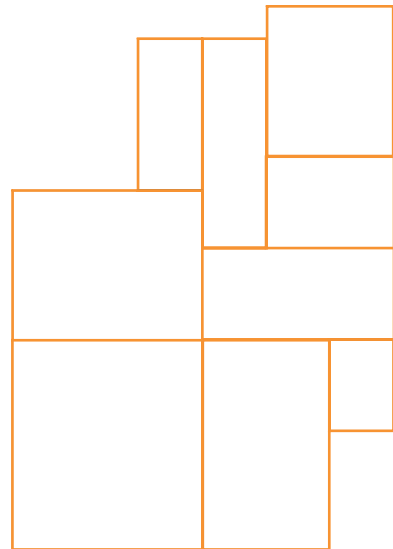


USABILITY > ACTIVITY > CONNECTIVITY > BEAUTY > OPENNESS > PAYFULNESS



Possible Composition of Structure based on 2nd Modeling

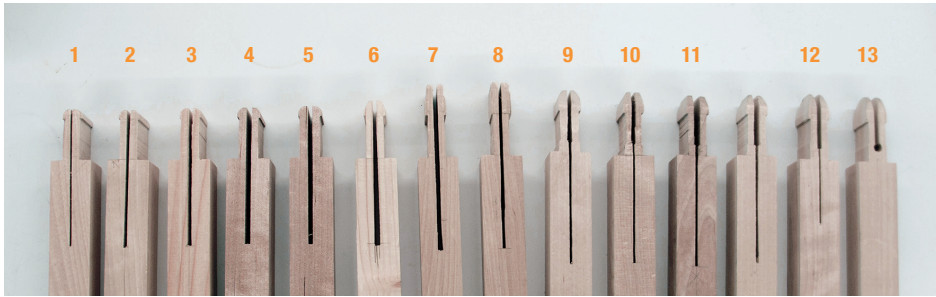
However, I have seen the process that naturally demonstrated the development of composition, when I dealt with surfaces.



5-3. 3rd modeling



The 3rd modeling continued in the same overall direction as the 2nd modeling; that is, the focus on functionality as a tool for constructing furniture was further developed. For the 3rd modeling, I needed to further develop the creative tool's joint part. In previous models, there was a weak point in the connective portions of the tool. Specifically, these connective areas would crack when weight was applied; therefore, the weak joints made it difficult to construct any weight-bearing furniture of any practical use.



STRENGTH + FLEXIBILITY

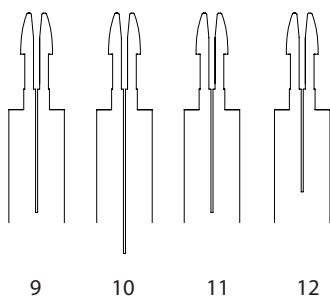
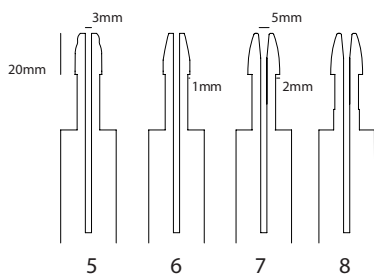
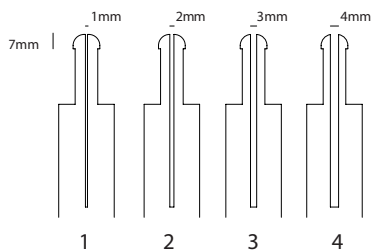
CONNECTIVITY > USABILITY > BEAUTY > ACTIVITY > OPENNESS > PLAYFULNESS

Subsequently, I attempted a different joint design that would allow for a stronger connective capacity.

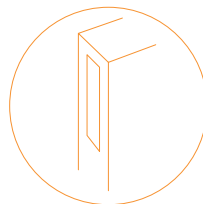
In detail, the joint design had been evolved step by step.

Firstly, I had to find a proper size for an easy-knock-down system (i.e., it should let the connective piece slide into the hole and then open again perfectly, snapping into place). Most challenging was finding the balance point where the connective pieces would join to each other in a fashion that allowed for adequate stability while also allowing for the flexibility of disconnecting the connective pieces when so desired.

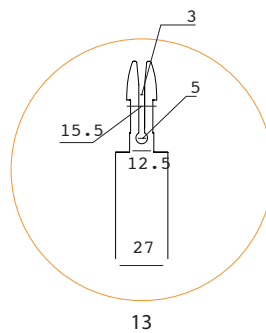
The strength and flexibility depend on the width of the cutting line: the shorter the cutting line, the stronger it will be. In the same way, the wider it is cut, the more flexibility it has. Such rules draw from principles in basic mathematics and physics. Finally, I was able to achieve a design that was both strong enough to grab and connect with other pieces but flexible enough to disconnect when so desired.



This is a drawing of the process to make a decision for finding proper shape for the stability and the flexibility.



The size of holes is 12.8x 27 mm



The width of the hole of the pieces is 12.5mm, So, positive pieces should be at least less than 12.5mm to slide in easily.

Also, there were experiments to find the right dimension for the width of cutting line from 1mm to 4mm. It was proved that 3mm would be flexible enough to slide into the hole.

After finding out the right dimension for the width of cutting line, I also needed to develop the form of grabbing parts for easy and comfortable feeling. Compare to previous tests that had 7mm heads, 20mm length of head is giving more comfortable feeling for a grab. Another point is that if there is a little bit open space of the head, It would be working more smoothly, and It can more safely support and grab by having enough spare length from 1mm to 2mm of the head.

Also, it was necessary to find a way for the stability. If I give them a different level, it helps to fix structures safely, but slide flexibly. Especially, for the less movement, I tried to minimize the length of the cutting line, because, when it became shorter, it will be stronger. But, as long as there is cutting line, it would never stop a little movement.

Even though there might be little movements, I found out a better solution for the flexibility. A hole of circle is replaced instead of a cutting line.

5-4. Final prototype

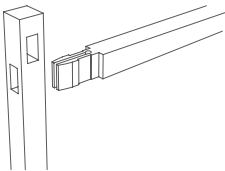
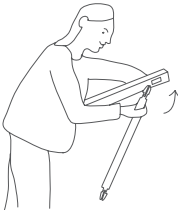
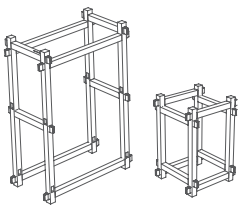
a piece of equipment, usually one that you hold in your hand, that is designed to allow you to create your own tool (e.g., a piece of furniture); these creative tools can be characterized by the following components: “openness,” “activity,” and “connectivity”.



+ DECISION FOR THE SET OF CREATIVE TOOLS

I tried to minimize the number of composite elements. By doing so, the set is more compact and affordable while still remaining usable.

Therefore, a standard set of creative tools is constituted of the basic elements needed to construct a simple stool and a table, and then, when a different type of furniture is so desired, it can easily be disassembled and then reassembled into that other form..

CONNECTIVITY	ACTIVITY	OPENESS
<p>Joint system</p> <p>The “continuity” component of my creative tools emphasizes the connecting of smaller parts to finally attain a larger result. I provide a joinery system that allows people to make structures by connecting smaller pieces. Because the pieces are assembled according to the planned use and imagination of its user, there might be hundreds of possible, different results.</p> 	<p>structuring a space</p> <p>the “activity” component is the part of the process when people must actually do the work of assembling their envisioned item. people create meaning in a space by configuring it in some way</p> 	<p>Various functions created by users</p> <p>open space presents the user with a kind of freedom to use the space as they wish; my creative tools provide people a similar exibility to create their own structures, whether these structures are ultimately meant to serve as furniture, or as things that are even grander or more abstract and artistic in scope.</p> 

“CONNECTIVITY”

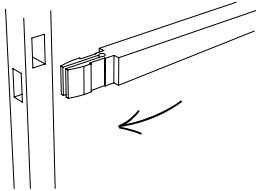
The “connectivity” component of my creative tools emphasizes the connecting of smaller parts to nally attain a larger result.



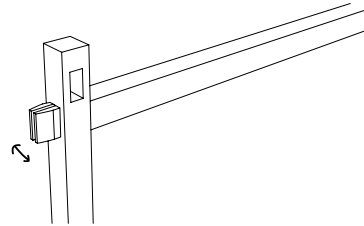
JOINT PRINCIPLE

Basically, the creative tools’ joint design is based on spring-folded wood.

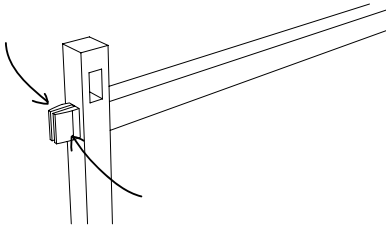
Notably, this joint system does not need any screws or nails



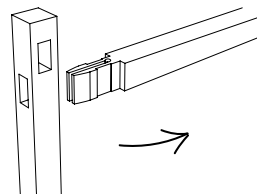
1. One connective piece is simply pushed into the hole of another connective piece (as you would a mortise and tenon).



2. After going through the hole, the connective piece’s spring-folded joint system closes and snaps into place.

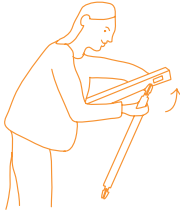


3. When disassembling, one needs only to push both sides of the ending of the joint part (i.e., the spring-folded joint).



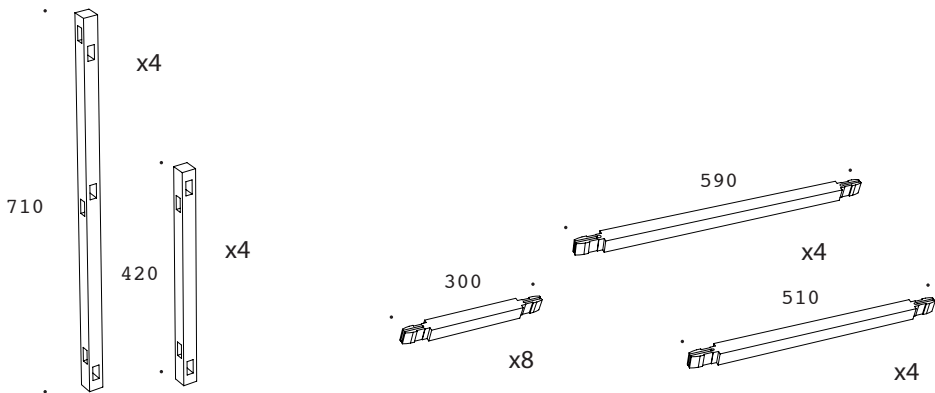
4. And then, it will naturally pull out of the hole.

“ACTIVITY”



The “activity” component is the part of the process when people must actually do the work of assembling their envisioned item.

Building a structure itself might be interpreted as an act of configuring space. By the structuring of our components, we enclose space and ultimately end up with a thing that has specific functions.



ELEMENTS _STRUCTURING PIECES

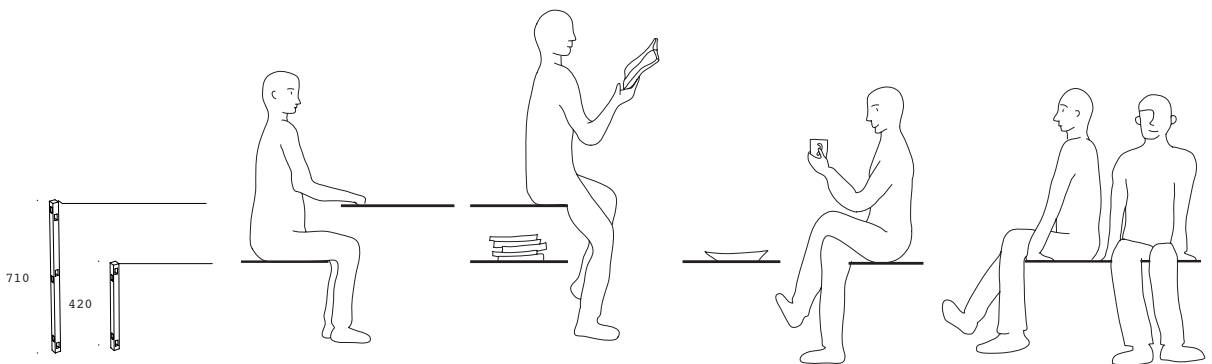
Basically, the sizes of the different pieces in the standard set of creative tools were determined based on what lengths would be necessary to form an ergonomically sound stool or table structure out of the pieces included in a standard set of creative tools.

All the elements (i.e., the pieces) for the 3rd modeling were scaled to achieve optimal dimensions for an ergonomically sound stool or table; subsequently, by experimenting with different scales, there remains the possibility of constructing different functionally ergonomic structures.

FUNCTION RELATES TO ELEMENTS

Ultimately, for the 3rd, and final, modeling, the dimensions of the elements are based on human scale. The purpose of this is to achieve a certain usability as furniture.

The height of 430cm is a basic dimension for sitting, and the height of 720cm is for table. and the length of 510cm and 590cm could be used for easy-table, bench. and book shelves.

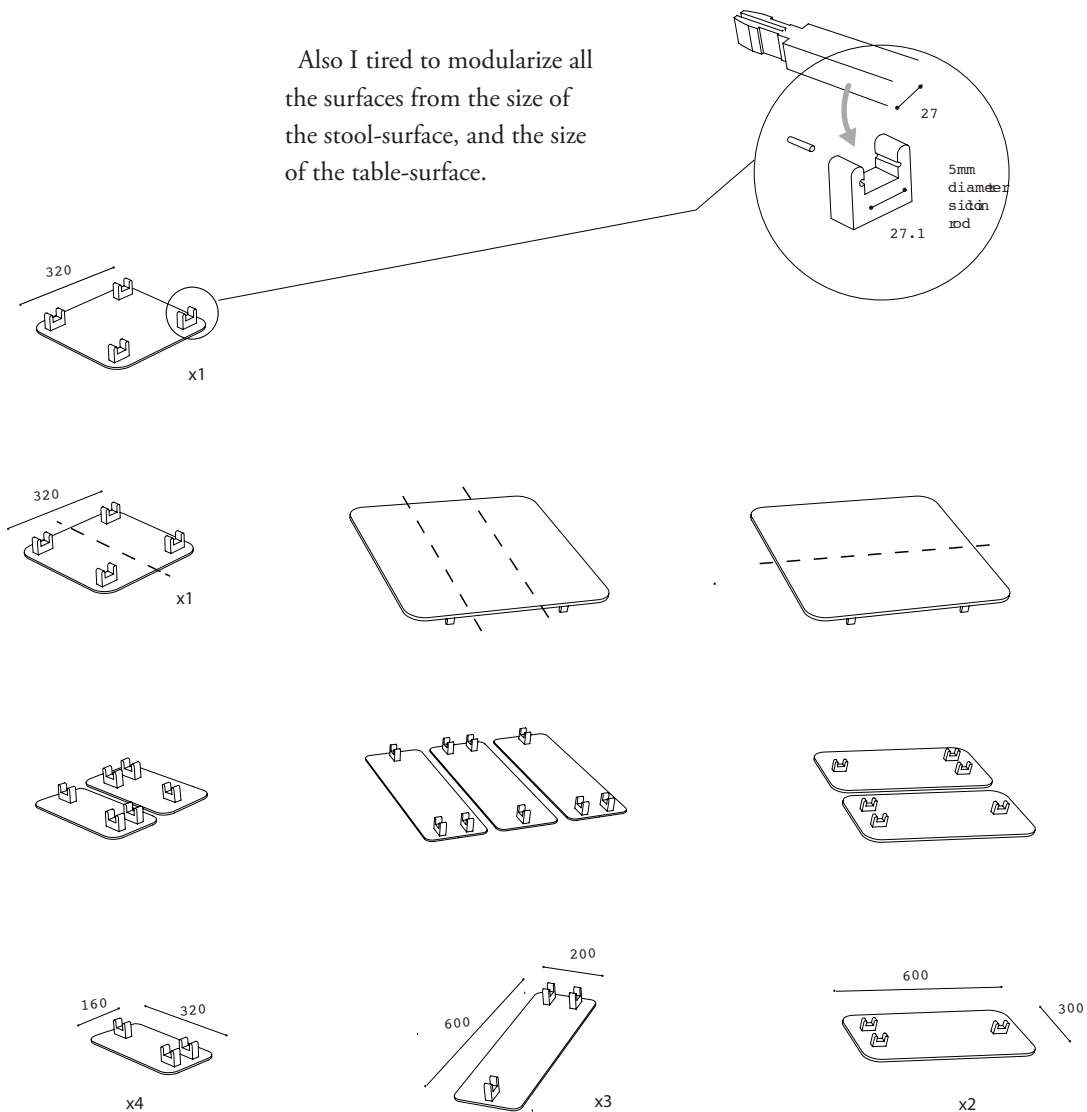


ELEMENTS _SURFACES

As the structure-pieces were from elements of a table and a stool, surfaces are also basically based on the sizes of a table and a stool.

Also I tried to modularize all the surfaces from the size of the stool-surface, and the size of the table-surface.

Furthermore, people might could match them on structures in a playful purpose.



COLOURS IN SURFACES

For the surfaces, bright and pastel tone of peach and orange was chosen since these colours generally are defined to be active and energetic. And also, for giving people more experience, veneer of oak, birch, and ash would be used for finishing.

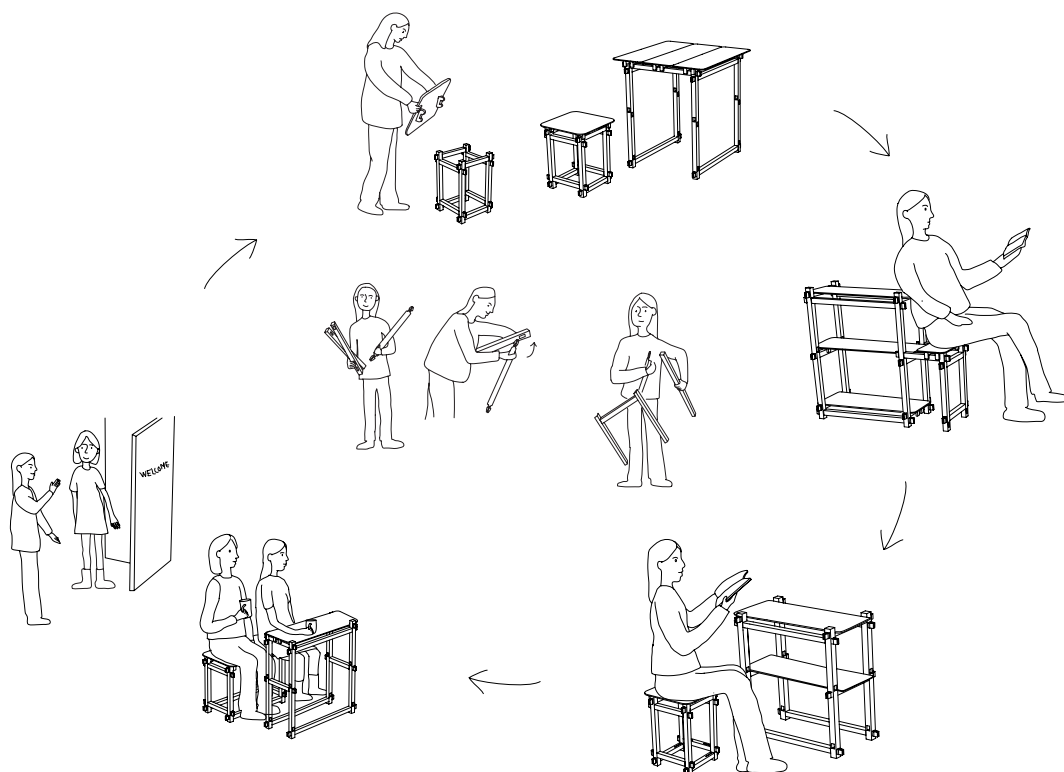


All these various choice of colours and material would help people to try, enjoy and experience creative tools more actively.

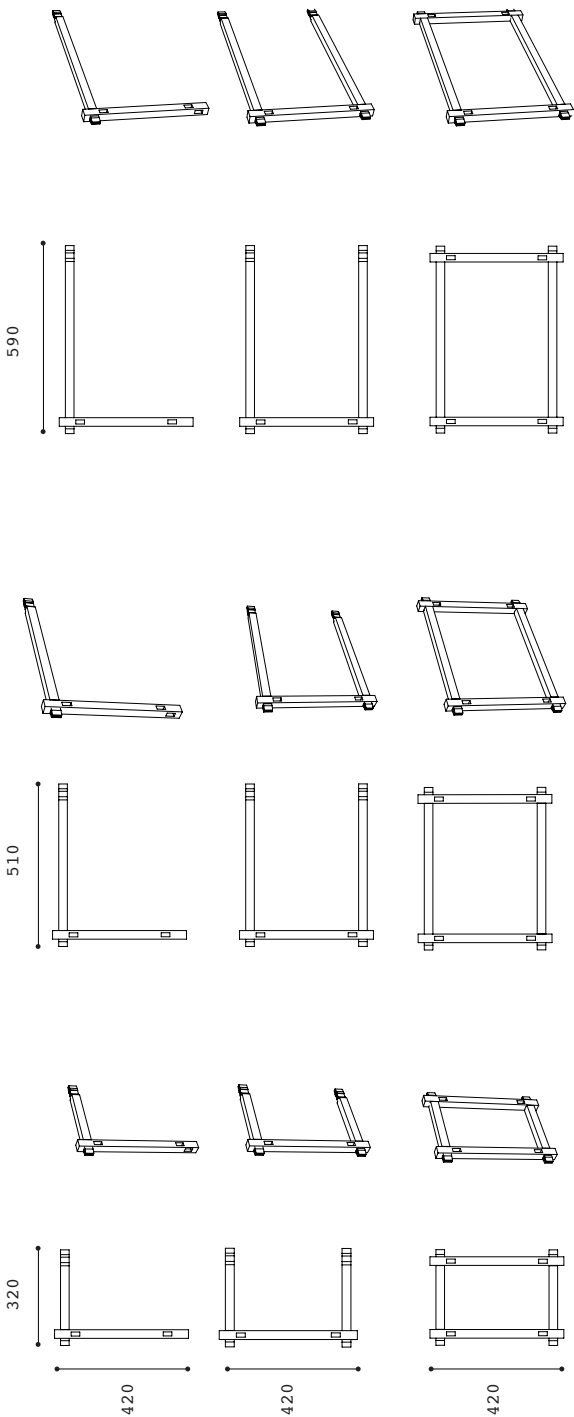


“OPENESS”

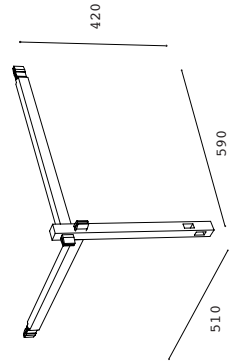
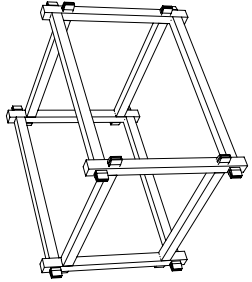
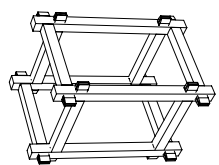
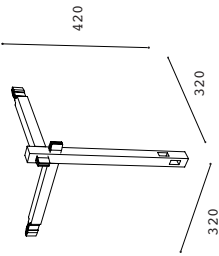
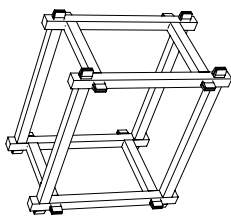
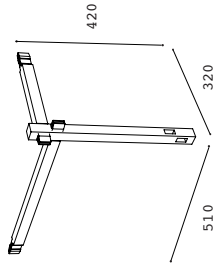
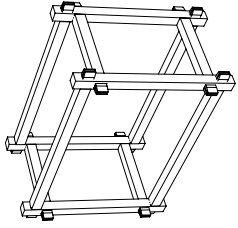
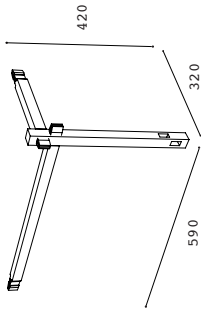
open functionality presents the user with a kind of freedom to use the space as they wish, my creative tools provide people a similar flexibility for them to create their own structures, whether these structures are ultimately meant to serve as furniture, or as things that are even grander in scope.

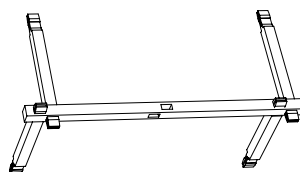
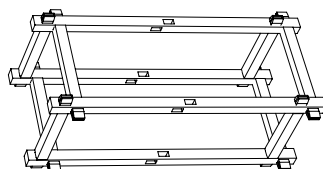
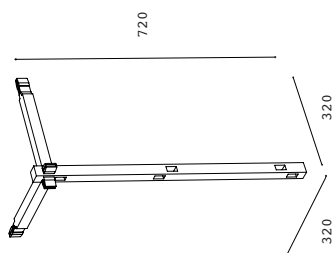
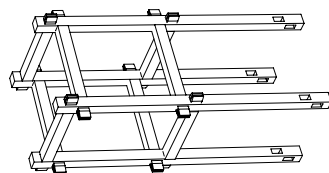
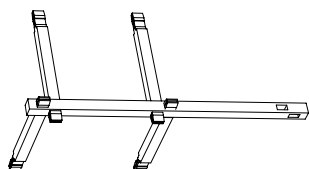
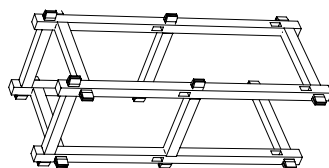
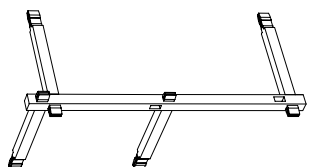


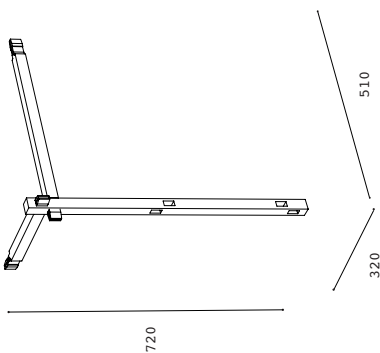
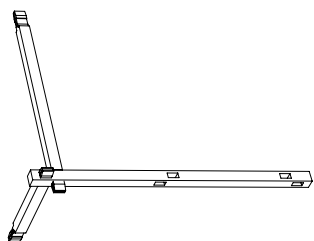
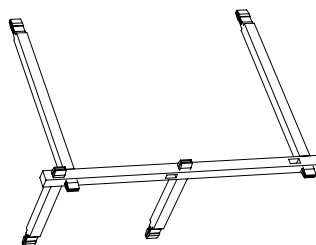
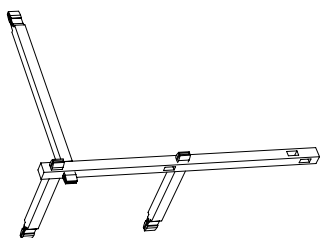
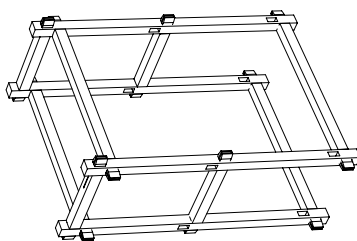
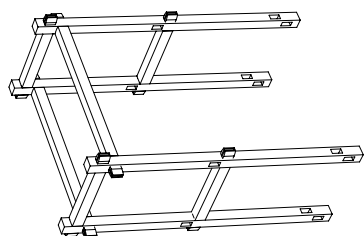
2D STRUCTURES

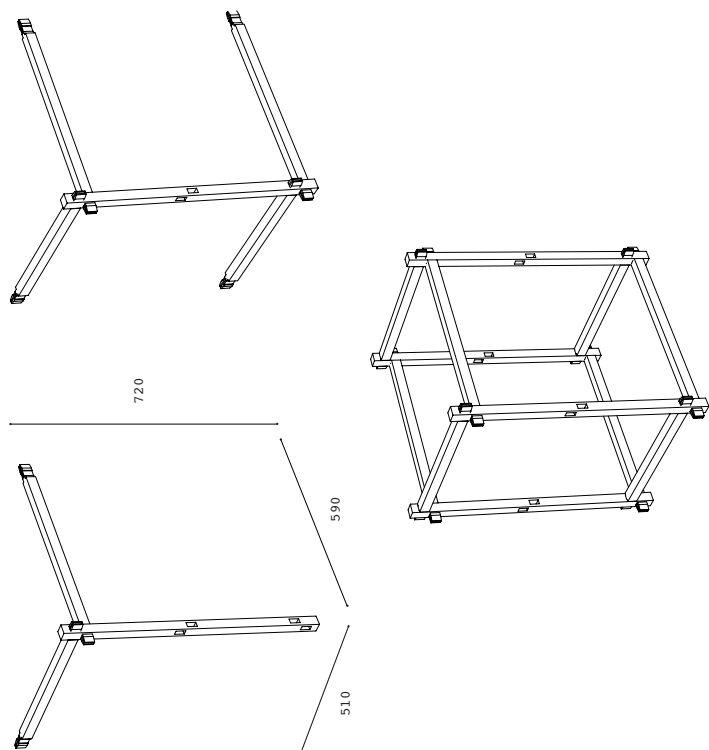


3D STRUCTURES

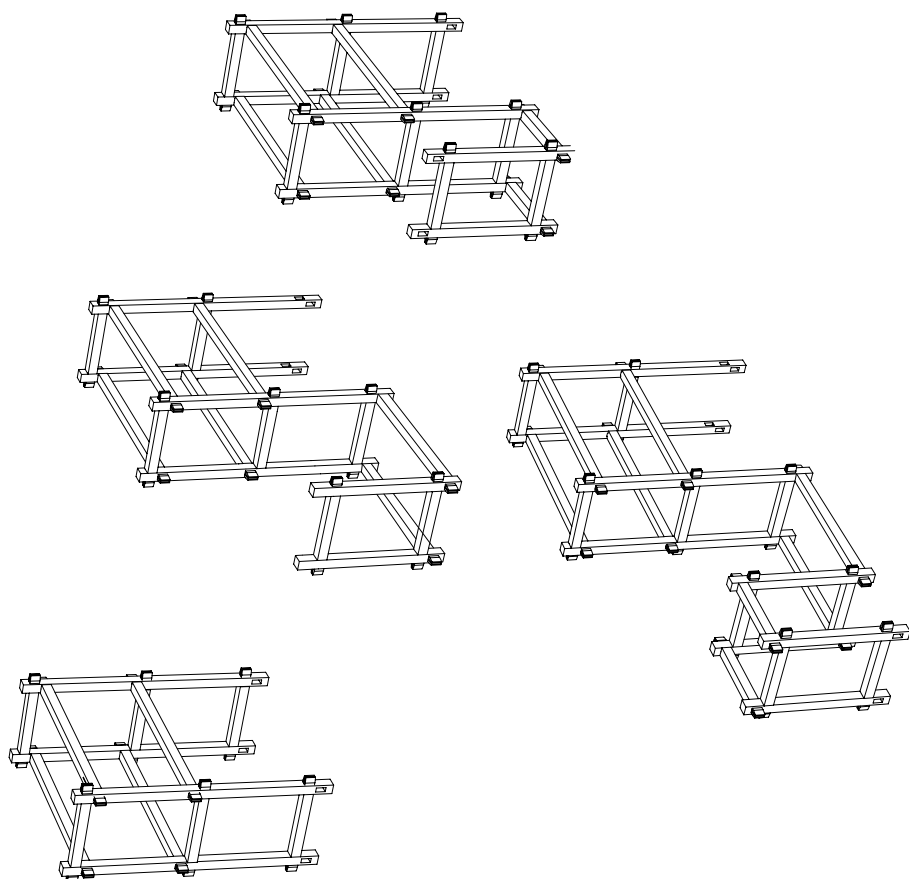




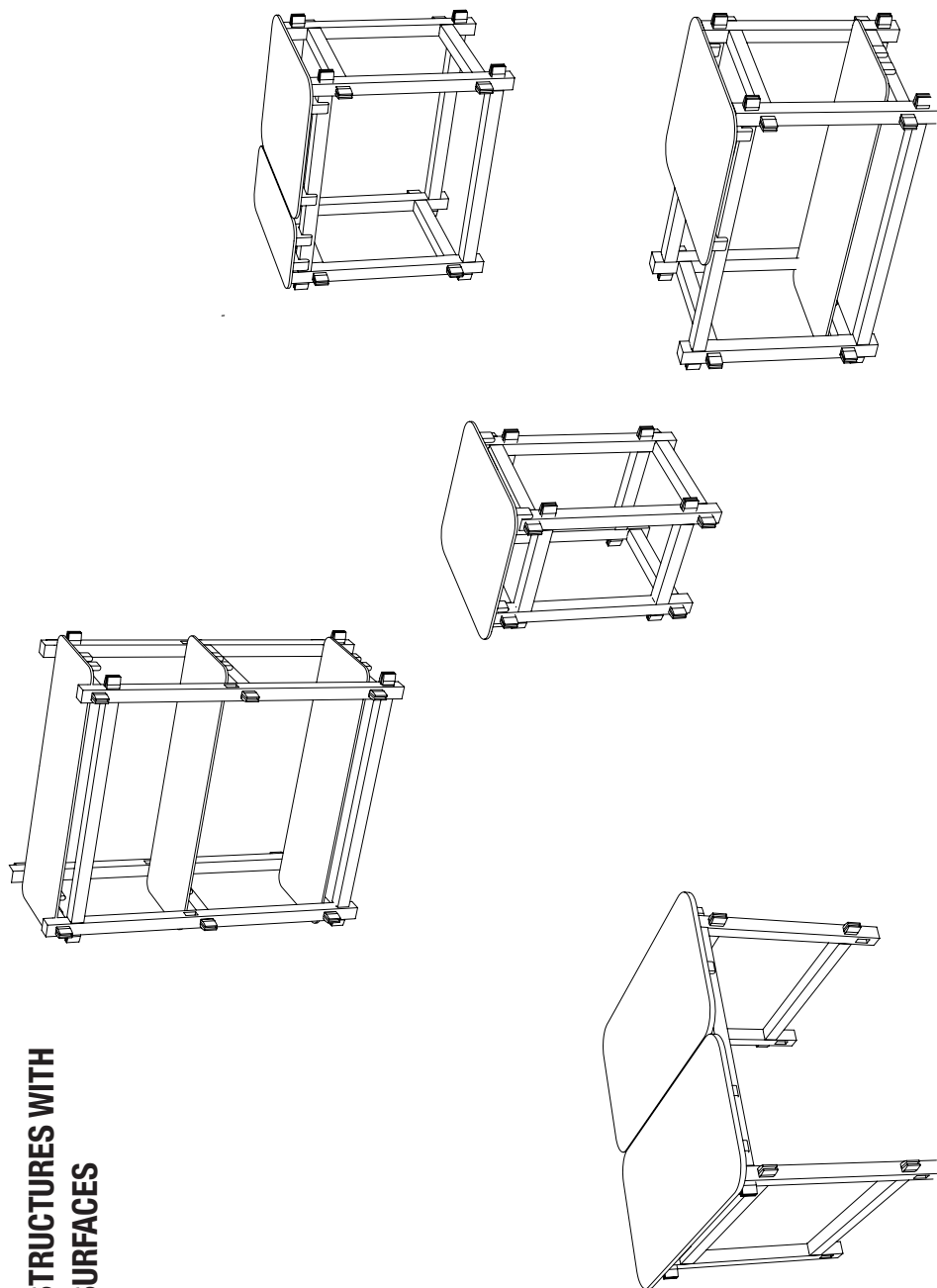




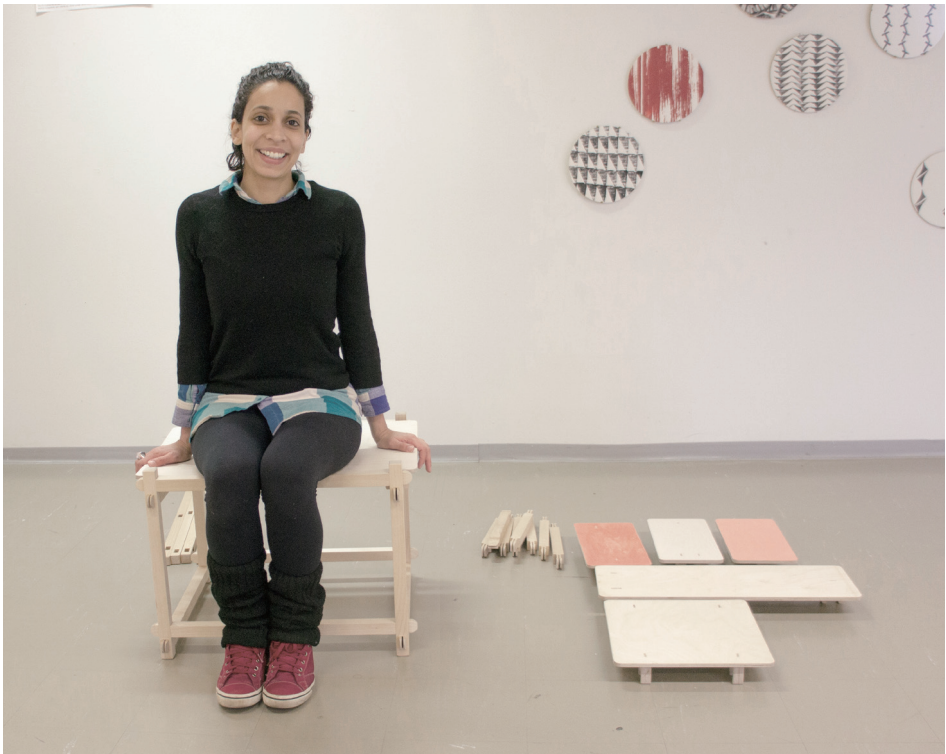
MIXED STRUCTURES



STRUCTURES WITH SURFACES



5-5. USER TEST





I conducted user-tests with mostly friends who were not previously familiar with my work on Creative Tools. All of them were from our school's art and design departments; therefore, given their creative backgrounds in art and design, even though I didn't give any instruction, they dealt with the tools rather intuitively and subsequently offered important feedback on the tools. This sparked another thought: if I could test the tools with people from different backgrounds, I could receive feedback from a greater diversity of distinct perspectives.

All different structures + But Need more structure.

All of the user-test participants created different structures using the Creative Tools, and they suggested more ideas on possible ways to develop the tools. For example, if the set of Creative Tools included higher standing elements, they could have constructed bigger structures like a small house; or, if there were more holes to which the pieces could connect to each other, they could have greater freedom and a wider range of possibilities in creating their structures.









CREATIVE TOOLS



A set of creative tools



Structuring elements of creative tools



Surfaces of creative tools











Limitation

When I did the user-test, I found out that, limitations to the Creative Tools offer both positive points (i.e. upsides) and negative points (i.e. downsides) at the same time.

If someone enjoys the process of measuring and matching/connecting all the pieces together, their personal enjoyment and interest will motivate a great effort in their own creative process with the tools: the user will think about what is the best way to proceed, given the limitations in environment and means. (For those who have a highly logical and programmatic way of thinking, they may feel that their experience with the Creative Tools resembles a kind of game.)

Given the limitations in connective angles, lengths, and locations of connecting points, the Creative Tools, when finally arranged, are most likely to result in a basic furniture form (e.g. chair, table).

However, the Creative Tools were originally motivated by a desire to equip people to create products whose scope extend beyond just furniture. So, my conclusive aim for the Creative Tools is to provide the environment and means by which people can create some beautiful and functional things of their own, furniture or not.

However, as a designer, I had to set practical preliminary goals for my prototype, and so, I could not help having to place certain practical limitations on the Creative Tools prototype. For this prototype, I focused on basic functionality (i.e., for building basic furniture items), which in turn restricted its freedom or flexibility element (i.e., what I define earlier as “openness”). While at the prototype stage the tools are specific to furniture-building, I hope to eventually further develop the tool so that the user will have greater freedom or flexibility to create her own products (whether they are furniture or not) using the Creative Tools.

For instance, someone with a more creatively independent mindset might want to try out a more unconventional possible structuring of the tools, and as a result, they might feel overly restricted by the limitations to the connective angles and the limited number of places to insert the pieces to the other pieces. Specifically, one participant in the user-test said that if it had more holes in the cross-direction she would have been able to more closely build what she had imagined.

Conclusion

SELF-EVALUATION AND CONCLUSION
QUESTIONS AND CONCLUSION

SELF-EVALUATION AND CONCLUSION

1 the balance of Creativity + Usability | 2 Sustainability | 3 About concepts

1 the balance of Creativity + Usability

Creativity

When user-testing my Creative Tools, participants were often hesitant to immediately begin constructing. It became obvious that they first needed some time to understand the function of each element-type. In this exploration process wherein participants attempted to figure out the tools' uses through their own experimentation, I observed that the participants defined and discovered their own new meanings and uses for different element-types. 'Observing how the participants each distinctly used the tools was perhaps the most interesting part of my thesis work.'

Usability

- Imagination

As a matter of fact, usability of the Creative Tools is indirectly connected to creativity. If these tools are easily understandable (and thus usable), it will spark people's creative minds to imagine, plan, and calculate not only to make simply creative products but ones that are useful as well.

- Play

There are also playful aspects: uncertainty and unpredictability have a role in arousing curiosity. When people are exploring the possibilities and attempting to structure the tools in a number of different ways, the forms are changing and changing, regardless of their first intentions. So, for someone who just enjoys exploring

these ways of structuring the Creative Tools, the experience would seem like playing.

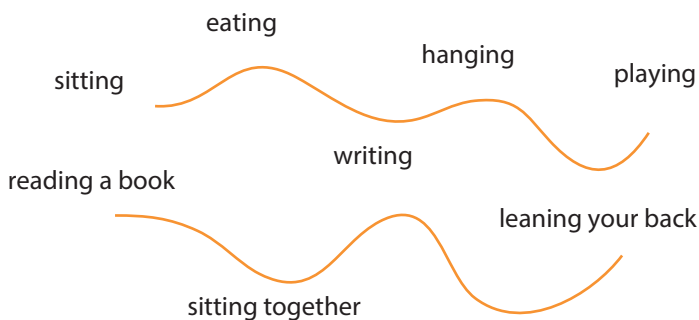
- **Physical Usability**

Overall, it is good that the flexibility inherent in the Creative Tools allows for a many possible ways to structure the elements. People can construct the structures appropriate for their specific situation themselves. Therefore, the Creative Tools would accommodate people's need instantly and continuously, over time and per situation.

2 Sustainability

After the user-testing, some questions regarding sustainability arose. There are many aspects of the environmental sustainability issue. Because the Creative Tools are designed for a variety of uses (and not just one), the Creative Tools present the possibility of a less cluttered lifestyle (i.e., one piece of furniture vs. many pieces of furniture). Additionally, given that its component materials are of high quality and long-lasting, the final product would be in support of a less wasteful and generally more environmentally sustainable lifestyle.

If something is motivated people, they would willing to do their sustainable choices spontaneously.



CONNECTIVITY
HOW



ACTIVITY
WHAT



OPENESS
WHY

3 About concepts

The main concepts at the foundation of “Creative Tools” are “Connectivity”, “Activity”, and “Openness”. Notably, these concepts are connected to each other in sequence.

If you try to use the “Creative Tools”, continuity will lead to activity: when you are exploring and using the tools’ connective functions, the activity of product formation occurs naturally. Then, there is the activity of working and connecting the elements into a more intentional, cohesive product that is based on some basic plan or imagination. The user will try to accomplish this plan in their own way by using their powers of imagination and physical assemblage. The flexibility allotted to the user to create based on her imagination is the “Openness” component, which is the third primary element behind the conception of the “Creative Tools.”

Also, all these concepts have concern with cause and effect. For example, “Openness” (creative freedom or flexibility) could be the main draw or reason for why you are using “Creative Tools.” To realize your imagination, you will engage in this “Creative Tools” activity by way of connecting the element pieces (i.e. Connectivity/Continuity).



QUESTIONS AND CONCLUSION

- **Designer's role**

Throughout this project, I have been thinking about what the designer's role would be. Originally, I wanted the Creative Tools to be way to give people a way to create their own products of practical need or artistic desire. This idea was based on the belief that everyone already has an inherent creativity and desire for personal expression. The Creative Tools would be a means of that very expression.

As people use a designer's product, the users also engage in a creative process by the way in which they use the products: they use the product in both the prescribed way and also in their own ways. When people modify and personalize tables or chairs according to their needs, they are effectively creating meanings through their use of the products.

Therefore, as a designer, I chose to provide a creative environment and means for people to create their own uses or meanings—to help them express their desires, rather than limit them to a wholly prescribed method, use, or function.

Providing a fun, open, active, infinite activity is also something that designers can give people.

I want to give people the opportunity to collaborate on design work together with me. Interacting with people through my Creative Tools has produced in me a decisive desire to continue expanding and developing on this Creative Tools work that I began here. And this love for collaboration and personal interaction is my motivation for designing anything.

I remember a conversation with a person who had just recently bought a piece of IKEA furniture, and I asked him why he bought an IKEA chair instead of something else. He said that even though the process of assembling the furniture was

hard, after doing it he got a feeling of achievement and a sort of ownership in its design. This is a simple example of how users can importantly, even if only in part, be involved in the design process.

My design choice is similar to the phenomenon discussed above because it involves the user's creative involvement to make something, and it does so in a more fun, open, active, infinite way. This is more than what IKEA furniture can do.

This design approach incorporates a participatory design approach (or “co-design thinking”).

The aim for designers totally depends on the individual designer's choice and on the given project's purpose or context. And, as long as designers are involved in people's lives in some way through their designs, they effectively influence people's behaviors and lives. Therefore, designers should take some responsibility of and interest in not just the products themselves but also on the processes of manufacturing and on the processes of conceptual development—all these factors have important effects on the designer's final product. The details in the design are important, as they may have social impact.

In many ways, designers give people the chance to challenge ideas or traditions. And this is accomplished by offering people the tools to explore new possibilities to think about and perhaps even re-think their own design language and expression.

This is the designer's role.

Reference

Literature

- Richard Sennett, *The Craftsman*, p.7-8, London, Penguin Books 2009
- Edited by Robert J. Sternberg, *The nature of Creativity*, Cambridge University Press 1988, 99-121p
- Edward de Bono, *How to have creative idea*, Random House, 2012, 9-4p
- Petroski, Henry, *The Evolution of Useful Things: How Everyday Artifacts-From Forks and Pins to Paper Clips and Zippers-Came to be as They are*. Vintage, USA, 51-57P, 1992
- Otto Friedrich Bollnow, translated by Christine Shuttleworth, Edited by Joseph Kohlmaier, *Human space*, Hypen Press, London, 2011, 254-255p
- Elizabeth B.-N. Sanders & Pieter Jan Stappers, *Co-creation and the new landscapes of design*, CoDesign, USA, 2008

Internet sources

- <http://www.epa.gov/oswer/docs/iwg/CellPhones.pdf>, accessed 05/09/2013
- <http://www.innerbody.com/anatomy/nervous/arm-hand>, accessed 04/09/2013
- http://en.wikipedia.org/wiki/Homo_faber, accessed 03/04/2014
- <http://www.macmillandictionary.com>, accessed 12/01/2014
- <http://www.australiangeographic.com.au/journal/worlds-oldestfishing-hook-found.htm/> accessed 08/16/2013
- <http://www.gregorylefever.com/pdfs/Walking%20Sticks%202.pdf/> accessed 08/16/2013
- <http://collections.vam.ac.uk/item/O78817/tambour-needle-unknown/> accessed 08/16/2013
- <http://www.designboom.com/history/wirehangers.html/> accessed 08/16/2013
- <https://www.google.com/patents/US514200/> accessed 08/16/2013
- <http://www.folkartmuseum.org/?p=folk&t=image&cid=4017/> accessed 08/16/2013
- http://www.nytimes.com/2012/05/13/magazine/who-made-that-clothespin.html?_r=1& /accessed 09/09/2013

IMAGE CREDITS

FIGURE

- 01** Photographed by Chris Jordan <http://www.chrisjordan.com/gallery/intolerable/#cellphones2> (Accessed 22/04/2014)
- 02** HUMAN BODY AND A HAND, Drawing by Hye yoon, Min
- 03** PAPERS OF QUESTIONNAIRE, Designed by Hye yoon, Min, filled up by respondents
- 04** GROUND AND STRAIGHT LINE, Drawing by Hye yoon, Min
- 05** MOUNTAIN AND DIAGONAL LINE, Drawing by Hye yoon, Min
- 06** SUN AND CIRCLE, Drawing by Hye yoon, Min
- 07** ANCIENT FISHING HOOK, <http://www.livescience.com/17186-oldest-fish-hooks-early-humans.html> (Accessed 22/04/2014)
- 08** WALKING STICK, <http://www.gregorylefever.com/pdfs/Walking%20Sticks%202.pdf> (Accessed 22/04/2014)
- 09** ANCIENT NEEDLE, <http://collections.vam.ac.uk/item/O78817/tambour-needle-unknown> (Accessed 22/04/2014)
- 10** HANGER, <http://www.designboom.com/history/wirehangers.html> (Accessed 22/04/2014)
- 11** BOTTLE OPENER, <https://www.google.com/patents/US514200> (Accessed 22/04/2012)
- 12** WOODEN CLOTHES HOOK, <http://www.folkartmuseum.org/?p=folk&t=images&id=4017> (Accessed 22/04/2014)
- 13** MULTI FUNCTIONAL HOOK, Designed by Hye yoon, Min
- 14** STRUCTURE, Drawing by Hye yoon, Min
- 15** Sudeok Temple, Yesan, Korea. Photographed by Hye yoon, Min
- 16** Chankyung palace, Seoul, Korea. Photographed by Hye yoon, Min
- 17** Patterns of traditional doors of Korea. <http://m.blog.daum.net/seogwipo/15969373> (Accessed 22/04/2014)
- 18** Museum of Korean traditional architecture. Photographed by Hye yoon, Min
- 19** Installation work applied traditional way of joints. Designed by Jong su, Kim. <http://blog.naver.com/PostView.nhn?blogId=aein1&logNo=10079398206> (Accessed 22/04/2014)
- 20** Korean traditional joint. Drawing by Hye yoon, Min
- 21** The process of the 1st modeling of creative tools for workshop, Photographed by Hye yoon, Min
- 22** The instruction how to use 1st creative tools. Photographed by Hye yoon, Min
- 23** 2D illustration of 1st creative tools. Drawing by Hye yoon, Min
- 24** Workshop process with children, drawing part. Photographed by Hye yoon, Min
- 25** Workshop process with children, structuring part. Photographed by Hye yoon, Min
- After chapter 5. The process of Mock-up and Modeling, the credit of all the images, drawing, and illustration belongs to Hye yoon, Min.

2014

HYE YOON, MIN

MAYJOR SUBJECT FURNITURE DESIGN

TITLE CREATIVE TOOLS

PROFESSOR JOUKO JARVISALO

TUTOR PEKKA HARNI

Special Thanks to
Justin, Lee for proofreading.

And
Yunghun, Kang for book design.

Also,
Thanks to my family, especially father in heaven,
And all my friends encouraging me.